

# **Smoke-Brulee Timber Sale Environmental Assessment**



**Libby Unit  
Northwest Land Office  
Montana Department of Natural Resources and Conservation  
August, 2017**



# **Smoke-Brulee Timber Sale**

## **Environmental Assessment**

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## Environmental Assessment

**Project Name: Smoke-Brulee Timber Sale**  
**Proposed Implementation Date: November 2017**  
**Proponent: Libby Unit, Northwest Land Office, Montana DNRC**  
**County: Lincoln**

### Type and Purpose of Action

#### Description of Proposed Action:

The Libby Unit of the Montana Department of Natural Resources and Conservation (DNRC) is proposing the Smoke-Brulee Timber Sale. The project is located 21 miles Southeast of Libby, Montana (refer to Attachments vicinity map A-1 and project map A-2) and includes the following sections:

Beneficiary	Legal Description	Total Acres	Treated Acres
Common Schools	Sec. 16, T27N, R29W	635.5	630
Public Buildings			
MSU 2 <sup>nd</sup> Grant			
MSU Morrill			
Eastern College-MSU/Western College-U of M			
Montana Tech			
University of Montana			
School for the Deaf and Blind			
Pine Hills School			
Veterans Home			
Public Land Trust			
Acquired Land			

Objectives of the project include:

- Treat stands to encourage a healthier, more vigorous condition
- Move stands toward the desired future condition
- Reduce forest fuels

Under the proposed Smoke-Brulee Timber Sale, DNRC would:

- Harvest approximately 4 - 5 million board feet from approximately 630 acres
- Generate an estimated \$600,000.00 – \$750,000.00 for the Common Schools Trust.
- Construct approximately 5-6 miles of new roads (Attachment A, Project Area Map).

- Burn slash following harvest activities
- Scarify and/or plant seedlings within harvested area as needed to promote adequate regeneration.

Proposed activities include:

Action	Quantity
<b>Proposed Harvest Activities</b>	<b># Acres</b>
Clearcut	
Seed Tree	
Shelterwood	630
Selection	
Commercial Thinning	
Salvage	
<b>Total Treatment Acres</b>	
<b>Proposed Forest Improvement Treatment</b>	<b># Acres</b>
Pre-commercial Thinning	
Planting	
<b>Proposed Road Activities</b>	<b># Miles</b>
New permanent road construction	4.2
New temporary road construction	1.5
Road maintenance	20.9
Road reconstruction	
Road abandoned	
Road reclaimed	
<b>Other Activities</b>	

<b>Duration of Activities:</b>	
<b>Implementation Period:</b>	

The lands involved in this proposed project are held in trust by the State of Montana. (Enabling Act of February 22, 1889; 1972 Montana Constitution, Article X, Section 11). The Board of Land Commissioners and the DNRC are required by law to administer these trust lands to produce the largest measure of reasonable and legitimate return over the long run for the beneficiary institutions (Section 77-1-202, MCA).

The DNRC would manage lands involved in this project in accordance with:

- The State Forest Land Management Plan (DNRC 1996),
- Administrative Rules for Forest Management (ARM 36.11.401 through 471),
- The Montana DNRC Forested State Trust Lands Habitat Conservation Plan (HCP) (DNRC 2010)
- and all other applicable state and federal laws.

## Project Development

## SCOPING:

- DATE:
  - June 20, 2016 – July 21, 2016
- PUBLIC SCOPED:
  - The scoping notice was posted on the DNRC Website:  
<http://dnrc.mt.gov/PublicInterest/Notices/Default.asp>
  - Adjacent landowners, statewide and Libby Unit scoping lists, published in the Western News on June 21, and 28, and July 5, 12, and 19, 2016.
- AGENCIES SCOPED:
  - United States Forest Service, Montana Fish, Wildlife, and Parks, various Native American tribes, and Lincoln, County
- COMMENTS RECEIVED:
  - How many: 2 External
  - External concerns: Montana FWP biologist – Supports the proposal to address forest health issues, although reduction to winter canopy cover for white-tailed deer winter range would be reduced. However, browse for elk and mule deer would be improved along with mule deer winter range. Confederated Salish and Kootenai Tribes found no cultural sites and approve project.
  - Internal comments are addressed in the Archeologist, Wildlife Biologist, Soil Scientist, and Hydrologist analysis.
  - Results (how were concerns addressed): Mitigated and incorporated in to the alternative

Internal and external issues and concerns were incorporated into project planning and design and will be implemented in associated contracts.

## INTERDISCIPLINARY TEAM (ID):

- Project Leader: Dave Marsh
- Archeologist: Pattick Rennie
- Wildlife Biologist: Leah Breidinger
- Hydrology/Soils: Marc Vessar
- Economist: N/A
- Silviculturist: (Vegetation analysis and silvicultural prescription conducted by project leader)

## OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED: (*Conservation Easements, Army Corps of Engineers, road use permits, etc.*)

- **United States Fish & Wildlife Service-** DNRC is managing the habitats of threatened and endangered species on this project by implementing the Montana DNRC Forested Trust Lands Habitat Conservation Plan (HCP) and the associated Incidental Take Permit that was issued by the United States Fish & Wildlife Service (USFWS) in February of 2012 under Section 10 of the Endangered Species Act. The HCP identifies specific conservation strategies for managing the habitats of grizzly bear, Canada lynx, and three fish species: bull trout, westslope cutthroat trout, and Columbia redband trout. This project complies with the HCP. The HCP can be found at [www.dnrc.mt.gov/HCP](http://www.dnrc.mt.gov/HCP)

- **Montana Department of Environmental Quality (DEQ)-** DNRC is classified as a major open burner by DEQ and is issued a permit from DEQ to conduct burning activities on state lands managed by DNRC. As a major open-burning permit holder, DNRC agrees to comply with the limitations and conditions of the permit.

A Short-term Exemption from Montana's Surface Water Quality Standards (318 Authorization) may also be required from DEQ if activities such as replacing a bridge on a stream would introduce sediment above natural levels into streams.

- **Montana/Idaho Airshed Group-** The DNRC is a member of the Montana/Idaho Airshed Group which was formed to minimize or prevent smoke impacts while using fire to accomplish land management objectives and/or fuel hazard reduction (Montana/Idaho Airshed Group 2006). The Group determines the delineation of airsheds and impact zones throughout Idaho and Montana. Airsheds describe those geographical areas that have similar atmospheric conditions, while impact zones describe any area in Montana or Idaho that the Group deems smoke sensitive and/or having an existing air quality problem (Montana/Idaho Airshed Group 2006). As a member of the Airshed Group, DNRC agrees to burn only on days approved for good smoke dispersion as determined by the Smoke Management Unit.
- **Montana Department of Fish, Wildlife and Parks (DFWP)-** A Stream Protection Act Permit (124 Permit) is required from DFWP for activities that may affect the natural shape and form of a stream's channel, banks, or tributaries. Such activities include:

## **ALTERNATIVES CONSIDERED:**

**No-Action Alternative:** Current uses would continue. Forest management activities would occur as budgets and Libby Unit priorities allow. Value of timber assets would be further reduced, with the current bark beetle infestation being left un-checked.

**Action Alternative:** Under the proposed Smoke-Brulee Timber Sale, DNRC would harvest approximately 4-5 million board feet from approximately 630 acres. Primarily shelterwood, and selection harvest prescriptions would be utilized to:

- improve stand growth and vigor, bring stands toward their desired future condition, reduce fuel loads to reduce the potential for stand replacing wildfire, and generate revenue for the common schools trust.

Ground based, and cable logging equipment would be used to conduct harvest operations. Approximately 5-6 miles of new roads (Attachment A, Project Area Map) would be constructed under this proposal.

Post timber harvest operations on 630 acres could include scarification, slashing, pre-commercial thinning and slash burning, as well as planting Western White Pine, Ponderosa pine, Western Larch, or Douglas-fir seedlings.

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## **Impacts on the Physical Environment**

## VEGETATION:

**Issues and Concerns-** The following issue statements were developed during scoping regarding the effects of the proposed action to vegetation:

- The current Douglas-fir beetle epidemic will continue to cause widespread mortality in Douglas-fir, while significantly reducing timber asset value to the common schools trust.
- Attempts should be made to maintain an adequate amount of old growth timber stands as per internal DNRC guidance.

**Recommended Mitigation Measures for Vegetation-** The analysis and levels of effects to vegetation resources are based on implementation of the following mitigation measures.

- Apply stand prescriptions as identified in Attachment E-1.
- Washing off-road equipment prior to on-site operations, and seeding newly constructed roads with grass.

**FOR COMPLETE VEGETATION ANALYSIS SEE ATTACHMENT E.**

## SOILS:

**Issues and Concerns-** The following issue statements were developed during scoping regarding the effects of the proposed action to soils:

- Timber harvesting activities may adversely affect soil resources due to increased compaction, displacement and erosion.
- Removal of both coarse and fine woody material off site during timber harvest operations can reduce nutrient pools required for future forest stands and can affect the long-term productivity of the site.
- Timber harvest, site preparation and road construction may increase slope instability.

**Recommended Mitigation Measures for Soils-** The analysis and levels of effects to soils resources are based on implementation of the following mitigation measures.

- 1) Limit equipment operations to periods when soils are relatively dry, (less than 20 percent oven-dried weight), frozen, or snow-covered in order to minimize soil compaction and rutting, and maintain drainage features. Check soil moisture conditions prior to equipment start-up.
- 2) On ground-based units, especially on previously harvested areas, the logger and sale administrator would agree to a skidding plan prior to equipment operations.

Skid-trail planning would identify which main trails to use and how many additional trails are needed. Trails that do not comply with BMPs (i.e. trails in draw bottoms) would not be used unless impacts can be adequately mitigated. Regardless of use, these trails may be closed with additional drainage installed, where needed, or grass-seeded to stabilize the site and control erosion.

- 3) Tractor skidding should be limited to slopes of less than 40 percent unless the operation can be completed without causing excessive displacement or erosion. Based on site review, short, steep slopes may require a combination of mitigation measures, such as adverse skidding to a ridge or winchline, and skidding from more moderate slopes of less than 40 percent.
- 4) Keep skid trails to 20 percent or less of the harvest unit acreage. Provide for drainage in skid trails and roads concurrently with operations.
- 5) Slash disposal: Limit the combination of disturbance and scarification to 30 to 40 percent of the harvest units. No dozer piling on slopes over 35 percent; no excavator piling on slopes over 40 percent, unless the operation can be completed without causing excessive erosion. Consider lopping and scattering or jackpot burning on the steeper slopes. Consider disturbance incurred during skidding operations to, at least, partially provide scarification for regeneration.
- 6) Retain 12 to 24 tons of large woody debris and a feasible majority of all fine litter following harvesting operations. On units where whole tree harvesting is used, consider implementing one of the following mitigations to minimize fine litter removal  
1) use in-woods processing equipment that leaves slash on site; 2) for whole-tree harvesting, return-skid slash and evenly distribute within the harvest area; or 3) cut tops from every third bundle of logs so that tops are dispersed as skidding progresses. 4) on cable harvest units, monitor limb breakage and lop tops as needed to minimize fine litter removal
- 7) Protect submerchantable trees and shrubs in draw bottoms from prescribed fire. Focus retention of leave trees in draw bottoms to promote slope stability.

**FOR COMPLETE SOILS ANALYSIS SEE ATTACHMENT B.**

## **WATER RESOURCES:**

**Issues and Concerns-** The following issue statements were developed during scoping regarding the effects of the proposed action to water resources:

- Timber harvesting and road construction activities may increase sediment delivery into streams and affect water quality.



- Cumulative effects from timber harvest may affect channel stability and fisheries habitat by increasing annual water yields and by decreasing the amount of recruitable woody debris into streams and /or increasing stream temperatures.

**Recommended Mitigation Measures for Water Resources-** The analysis and levels of effects to water resources are based on implementation of the following mitigation measures.

- Use all applicable Forestry BMPs.
- Follow Soils Analysis mitigations above.

**FOR COMPLETE WATER RESOURCES ANALYSIS SEE ATTACHMENT C.**

**FISHERIES RESOURCES** (*including unique, federally listed as threatened or endangered, sensitive, and/or species of special concern*):

N/A

**WILDLIFE** (*terrestrial & avian including unique, federally listed as threatened or endangered, sensitive, and/or species of special concern*):

**Issues and Concerns-** The following issue statements were developed during scoping regarding the effects of the proposed action to wildlife:

- *Mature forest cover and connectivity.* The proposed activities could decrease mature forested cover, which could reduce habitat connectivity and suitability for wildlife species associated with mature forests.
- *Old-growth forests.* The proposed activities could affect wildlife species associated with old-growth forests by reducing habitat availability and increasing fragmentation.
- *Canada lynx.* The proposed activities could reduce landscape connectivity and the availability of suitable Canada lynx habitat, reducing the capacity of the area to support Canada lynx.
- *Grizzly bears.* The proposed activities could affect grizzly bear cover, affect important habitat, and increase human access, which could adversely affect bears by displacing them from important habitat, and/or by increasing risk of human-caused bear mortality.
- *Fishers.* The proposed activities could reduce the availability and connectivity of suitable fisher habitat and increase human access, which could reduce fisher habitat suitability and increase trapping mortality.
- *Flammulated owls.* The proposed activities could alter the structure of flammulated owl preferred habitat, which could reduce habitat suitability for flammulated owls.
- *Pileated woodpeckers.* The proposed activities could reduce tree density and alter the structure of mature forest stands, which could reduce habitat suitability for pileated woodpeckers.
- *Big game winter range.* The proposed activities could reduce cover, which could reduce the quality of big game winter range habitat.

**Recommended Mitigation Measures for Wildlife-** The analysis and levels of effects to wildlife are based on implementation of the following mitigation measures.

- If a threatened or endangered species is encountered, consult a DNRC biologist immediately. Similarly, if undocumented nesting raptors or wolf dens are encountered within ½ mile of the Project Area contact a DNRC biologist.
- Prohibit contractors and purchasers conducting contract operations from carrying firearms while on duty as per *ARM 36.11.444(2)* and *GB-PR2 (USFWS and DNRC 2010)*.
- Contractors will adhere to food storage and sanitation requirements as described in the timber sale contract. Ensure that all attractants such as food, garbage, and petroleum products are stored in a bear-resistant manner.
- Restrict public access at all times on restricted roads that are opened for harvesting activities. Effectively close all restricted roads following harvest completion.
- Retain patches of advanced regeneration of shade-tolerant trees as per *LY-HB4* on north-facing slopes (*USFWS and DNRC 2010*).
- To protect nesting northern goshawks, prohibit hauling along affected portions of the Smoke Creek haul route April 1- August 15; timing restrictions may be lifted if the territory is unoccupied or reduced if the chicks fledge before August 15.
- Prohibit all mechanized activities including commercial forest management and use of pickups from April 1-June 15 to provide seasonal security for grizzly bears.
- Retain visual screening along roads where possible to increase security for wildlife.
- Retain at least 2 snags and 2 snag recruits per acre that are ≥ 21 inches diameter or the next largest available size class, favoring western larch, ponderosa pine, and Douglas-fir for retention. If snags are cut for safety concerns, they must be left in the harvest unit.
- Retain 12 to 24 tons/acre of coarse-woody debris. Retain coarse-woody debris according to *ARM 36.11.414* and emphasize retention of 15-inch diameter downed logs aiming for at least one 20-foot-long section per acre.

## **FOR COMPLETE WILDLIFE ANALYSIS SEE ATTACHMENT D.**

### **AESTHETICS:**

Any change to the scenery in the area from these alternatives would be in addition to past activity within the project area. This analysis includes all past and present effects.

**Issues and Concerns-** The following issue statements were developed during scoping regarding the effects of the proposed action to aesthetics:

- Timber harvest, and associated road construction may adversely affect the visual quality from US Highway 2.

**Recommended Mitigation Measures for Aesthetics-** The analysis and levels of effects to aesthetics are based on implementation of the following mitigation measures.

- Limit road construction only to the extent reasonable to effectively access timber.
- Utilize shelter wood treatments that favor retention of healthy trees to reduce the visual contrast between adjacent, managed, and un-managed land.

### **Existing Conditions**

The project area is bordered on three sides by heavily managed private timberland. Approximately 1/3 of the project area has been selectively harvested, including a portion of what is most visible from highway 2.

### **Environmental Effects**

Although the project area is located approximately two miles from US Highway 2, harvest units are not expected to stand out excessively due to the prescribed shelter wood harvest treatments, and recent harvest treatments on adjacent private, industrial land.

### **-VISUAL QUALITY**

#### **No-Action Alternative:**

No road construction or timber harvest would take place in the project area at this time. Hard edges along the three property lines bordering intensively managed corporate timber land would persist.

#### **Action Alternative:**

Road construction necessary for reasonable access to timber, and shelterwood harvest treatment would occur at this time.

#### ***Direct, Secondary, and Cumulative Effects***

Due to the 2 mile distance from Highway 2, the presence intensively managed timber stands bordering the project area on three sides, and the proposed shelter wood harvest treatment, impacts to visual quality would be expected to be low to moderate.

Through the proposed sale area, slash from the harvest would be noticeable yet temporary. Generally slash disappears from the site within five years, and is often covered by other vegetation within three years. Again, sites would be generally lighter in color than can be seen currently.

### **-NOISE**

#### **No-Action Alternative:**

Noise from the highway, as well as from nearby forest management and farming operations on other land ownerships in the area would continue.

#### **Action Alternative:**

#### ***Direct, Secondary, and Cumulative Effects***

Harvest activities would be quite audible, and, depending upon air conditions, equipment could be heard many miles from their location. Noise would be generated by harvest operations, harvest related traffic, road construction, and administrative oversight. This could be expected to be present for the entire season of harvest, typically from mid-June through mid-March of the following year, for the duration of the harvest of two to three years during the general "work week".

Based on the anticipated operating periods and the short duration of the timber sale direct, secondary, and cumulative effects of noise will be low.

### **HISTORICAL AND ARCHEOLOGICAL SITES:**

The tribes were scoped, but none identified a specific cultural resource concern. The former DNRC archaeologist conducted a Class III intensity level cultural and paleontological resources inventory of the much of the area of potential effect (APE). Despite a detailed examination of the APE, no cultural or fossil resources were identified and no additional archaeological or paleontological investigative work is recommended. Authorization of the proposed timber sale will have No Effect to Antiquities as defined under the Montana State Antiquities Act. A formal report of findings has been prepared and is on file with the DNRC and the Montana State Historic Preservation Officer:

Passmann, Dori

1988 Poker-Smoke Timber Sale. Report prepared for the Montana Department of Natural

### **DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR, AND ENERGY:**

There will be no measurable direct, secondary, and cumulative impacts related to environmental resources of land, water, air, and energy due to the relatively small size of the timber sale project.

### **OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA:**

- No other environmental documents are known of that would affect the project area.

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## **Impacts on the Human Population**

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### **HUMAN HEALTH AND SAFETY:**

#### **Air Quality**

The DNRC is a member of the Montana/Idaho Airshed Group which was formed to minimize or prevent smoke impacts while using fire to accomplish land management objectives and/or fuel hazard reduction (Montana/Idaho Airshed Group 2006). The Group determines the delineation of airsheds and impact zones throughout Idaho and Montana. Airsheds describe those geographical areas that have similar atmospheric conditions, while impact zones describe any area in Montana or Idaho that the Group deems smoke sensitive and/or having an existing air quality problem (Montana/Idaho Airshed Group 2006).

The project area is located within Montana Airshed 1, which encompasses portions of Sanders and all of Lincoln Counties. Currently, this Airshed does contain an impact zone covering the town of Libby.

**Issues and Concerns-** The following issue statements were developed during scoping regarding the effects of the proposed action to air quality:

- Smoke will be produced during pile burning.
- Dust will be produced during harvesting and hauling activities.

**Recommended Mitigation Measures for Air Quality-** The analysis and levels of effects to air quality are based on implementation of the following mitigation measures:

- Only burn on days approved by the Montana/Idaho Airshed group and DEQ.
- Conduct test burn to verify good dispersal.
- Dust abatement may be used as necessary.
- Slower speed limits may be included in contracts as necessary to reduce dust.

## **-SLASH BURNING**

### **No-Action Alternative:**

No slash would be burned within the project areas. Thus, there would be no effects to air quality within the local vicinity and throughout Airshed 1.

### **Action Alternative:**

#### ***Direct and Secondary Effects***

Slash consisting of tree limbs and tops and other vegetative debris would be piled throughout the project area during harvesting. Slash would ultimately be burned after harvesting operations have been completed. Burning would introduce particulate matter into the local airshed, temporarily affecting local air quality. Burning within the project area would be short in duration and would be conducted when conditions favor good to excellent ventilation and smoke dispersion as determined by the Montana Department of Environmental Quality and the Montana/Idaho Airshed Group. The DNRC, as a member of the Montana/Idaho Airshed Group, would burn only on approved days.

Thus, direct and secondary effects to air quality due to slash burning associated with the proposed action would be minimal.

#### ***Cumulative Effects***

Cumulative effects to air quality would not exceed the levels defined by State of Montana Cooperative Smoke Management Plan (1988) and managed by the Montana/Idaho Airshed Group. Prescribed burning by other nearby airshed cooperators (for example the U.S. Forest Service) would have potential to affect air quality. All cooperators currently operate under the same Airshed Group guidelines. The State, as a member, would burn only on approved days. This should decrease the likelihood of additive cumulative effects. Thus, cumulative effects to air quality due to slash burning associated with the proposed action would also be expected to be minimal.

## **-DUST**

### **No-Action Alternative:**

No increased dust would be produced as a result of the proposed timber sale. Current levels of dust would be produced in the area.

### **Action Alternative:**

#### ***Direct, Secondary, and Cumulative Effects***

Harvesting operations would be short in duration. Dust may be created from log hauling on portions of native surface roads during summer and fall months. Contract clauses would provide for the use of dust abatement or require trucks to reduce speed if necessary to reduce dust near any affected residences.

Thus, direct, secondary, and cumulative effects to air quality due to harvesting and hauling associated with the proposed action would be minimal.

### Log Hauling Traffic

Log hauling traffic is common in the project area.

**Issues and Concerns-** The following issue statements were developed during scoping regarding the effects of the proposed action to log hauling traffic:

- There will be increased travel on weekends.
- Trucks will drive fast.

**Recommended Mitigation Measures for Log Hauling Traffic-** The analysis and levels of effects of log hauling traffic is based on implementation of the following mitigation measures:

- Log hauling will take place typically from during the general “work week”.
- Signs will be posted making the public aware of log hauling traffic in the area.
- If necessary, a slower speed limit may be imposed in the timber harvest contract.

### No-Action Alternative:

No increase in log truck traffic would occur.

### Action Alternative:

#### ***Direct, Secondary, and Cumulative Effects***

Log truck traffic in the area would increase for the duration of the timber sale. However signs will be posted indicating that log truck traffic is present in the area. If necessary, a slower speed limit may be imposed in the timber harvest contract.

Based on the mitigation measures direct, secondary, and cumulative effects of log hauling on human health and safety would be minimal.

### **RECREATION** *(including access to and quality of recreational and wilderness activities):*

The area is used for hiking, hunting, cross-country skiing, snowmobiling and general recreating. Currently, roads through the area are closed to motorized use and used only for administrative purposes. There would be no change in road closure status and the selection of either alternative would not affect the ability of people to recreate on this parcel.

There will be no change from existing conditions. Therefore, there would be no measurable direct, secondary, or cumulative impacts on recreation from this proposed action.

Will Alternative result in potential impacts to:	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
<b>No-Action</b>														

Will Alternative result in potential impacts to:	Impact												Can Impact Be Mitigated?	Comment Number
	Direct				Secondary				Cumulative					
	No	Low	Mod	High	No	Low	Mod	High	No	Low	Mod	High		
Health and Human Safety	X				X				X					
Industrial, Commercial, and Agricultural Activities and Production	X				X				X					
Quantity and Distribution of Employment	X				X				X					
Local Tax Base and Tax Revenues	X				X				X					
Demand for Government Services	X				X				X					
Density and Distribution of Population and Housing	X				X				X					
Social Structures and Mores	X				X				X					
Cultural Uniqueness and Diversity	X				X				X					
<b>Action</b>														
Health and Human Safety		X			X				X					1
Industrial, Commercial, and Agricultural Activities and Production		X			X				X					2
Quantity and Distribution of Employment		X			X				X					3
Local Tax Base and Tax Revenues	X				X				X					
Demand for Government Services	X				X				X					
Density and Distribution of Population and Housing	X				X				X					
Social Structures and Mores	X				X				X					
Cultural Uniqueness and Diversity	X				X				X					

**Comments:**

1. No unusual safety considerations are associated with the proposed project. Because of the relatively small size of the proposed project, and mitigations measure that would be taken, health and safety risks posed by the project would be minimal.
2. A consistent flow of timber contributes towards meeting the current and future demand of these construction materials.
3. Employment in the logging industry is common in the area and this project would in a small part contribute to local employment.

**LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS** *(includes local MOUs, management plans, conservation easements, etc):*

Weyerhaeuser land bordering the project area to the north and the west is covered by the Fisher River Conservation Easement.

**OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:**

The proposed action has a projected harvest volume between 4 and 5 MMBF. This volume is worth approximately \$130.00/MBF delivered to a forest products manufacture site at current market prices. Delivered to market, the proposed action has a total revenue value of an estimated \$585,000.00. Removing the timber sale purchaser's contracted operations and DNRC's development, administration, and operation expenses, the trust beneficiaries net between an estimated 15 and 35 percent of total delivered sawlog market value. Therefore, the proposed action may generate net income for trust beneficiaries between \$87,750.00 and \$204,750.00.

Costs related to the administration of the timber sale program are only tracked at the Land Office and Statewide level. DNRC does not track project-level costs for individual timber sales. An annual cash flow analysis is conducted on the DNRC forest product sales program.

Revenue and costs are calculated by land office and statewide. These revenue-to-cost ratios are a measure of economic efficiency. A recent revenue-to-cost ratio of the Northwestern Land Office was 2.6. This means that, on average, for every \$1.00 spent in costs, \$2.60 in revenue was generated. Costs, revenues, and estimates of return are estimates intended for relative comparison of alternatives. They are not intended to be used as absolute estimates of return.

Mills in Montana need 351 MMBF per year to maintain current production levels and industry infrastructure. Currently the Sustained yield and target harvest from Trust Lands is 57.6 MMBF, which represents approximately 16.4% of timber harvested in the state of Montana. This project would provide approximately 4.5 MMBF of timber towards the sustained yield target thus helping sustain current mill capacity.

**Environmental Assessment Checklist Prepared By:**

**Name: Dave Marsh**

**Title: Forest management Supervisor**

**Date: August 28, 2017**

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**Finding**

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**Alternative Selected**

The Action Alternative meets the project objectives and is selected for implementation. The No action alternative fails to meet the stated objectives concerning this project.

**Significance of Potential Impacts**

No significant impacts have been identified to occur as a result of the implementation of the Action Alternative.

**Need for Further Environmental Analysis**



☐

EIS

☐

More Detailed EA

☒

No Further Analysis

**Environmental Assessment Checklist Approved By:**

**Name:** Doug Turman

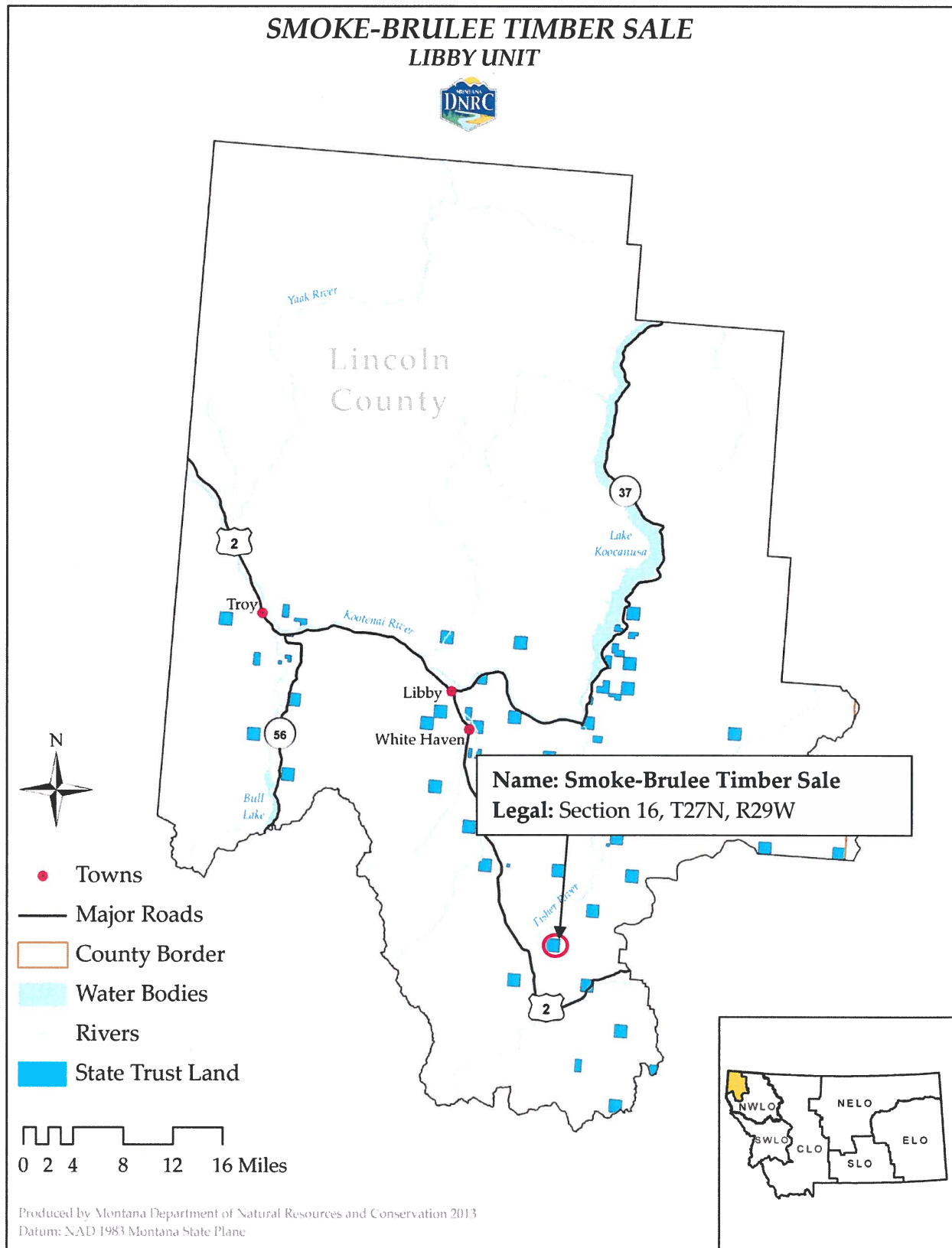
**Title:** Libby Unit Manager

**Date:** 2/9/2018

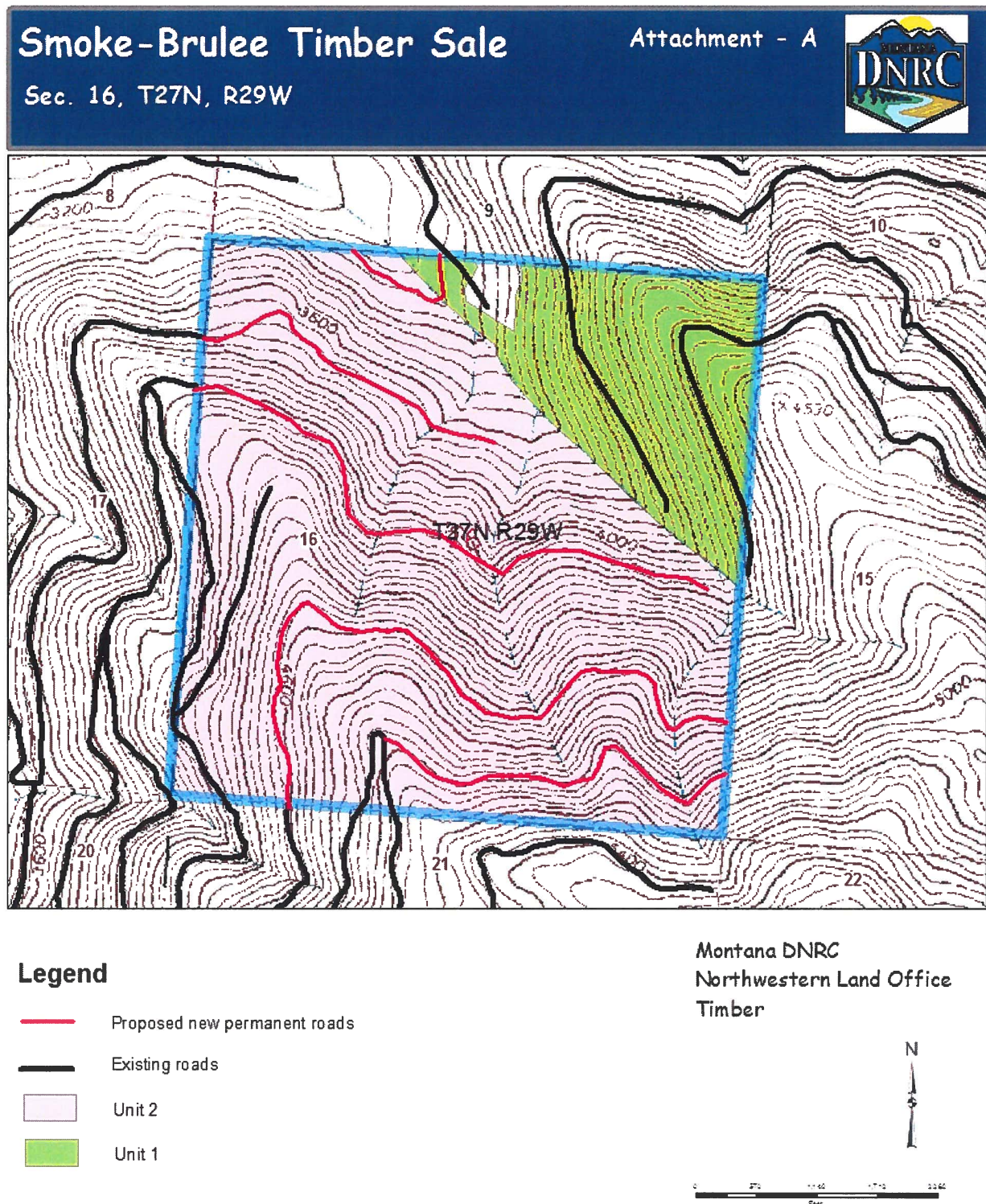
**Signature:** Doug Turman

## **Attachment A - Maps**

A-1: Smoke-Brulee Timber Sale Vicinity Map



A-2: Smoke-Brulee Timber Sale Harvest Units





## **Attachment B – Soils Analysis**

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## Smoke Brulee Timber Sale – Soils Analysis

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### Analysis Prepared By:

**Name:** Marc Vessar

**Title:** Forest Hydrologist, Montana DNRC

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## Introduction

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The following analysis will disclose anticipated effects to soil resources within Smoke Brulee project area. Direct, secondary, and cumulative effects to soil resources of both the No-Action and Action alternatives will be analyzed.

DNRC strives to maintain soil productivity by limiting cumulative soil impacts to 15 percent or less of a harvest area, as noted in the SFLMP (DNRC 1996). As a recommended goal, if existing detrimental soil effects exceed 15 percent of an area, proposed harvesting should minimize any additional impacts. Harvest proposals on areas with existing soil impacts in excess of 20 percent should avoid any additional impacts and include restoration treatments, as feasible, based on site-specific evaluation and plans.

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## Issues and Measurement Criteria

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- Timber harvesting activities may adversely affect soil resources due to increased compaction, displacement and erosion.
- Removal of both coarse and fine woody material off site during timber harvest operations can reduce nutrient pools required for future forest stands and can affect the long-term productivity of the site.
- Timber harvest, site preparation and road construction may increase slope instability.

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## Regulatory Framework

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The following plans, rules, and practices have guided this projects planning and/or will be implemented during project activities:

The Administrative Rules for Forest Management (ARM 36.11.401 to 456) include several rules that guide conservation of soils resources. The Administrative Rules were generally adopted from recommendations in the State Forest Land Management Plan (SFLMP) (DNRC 1996). The project area is also covered by the Montana DNRC Forested Trust Lands Habitat Conservation Plan (HCP) (2012). The project was developed to be compliant with both the Administrative Rules and the HCP.

DNRC strives to maintain soil productivity by limiting cumulative soil impacts to 15 percent or less of a harvest area, as noted in the SFLMP (DNRC 1996). As a recommended goal, if existing detrimental soil effects exceed 15 percent of an area, proposed harvesting should minimize any additional impacts. Harvest

proposals on areas with existing soil impacts in excess of 20 percent should avoid any additional impacts and include restoration treatments, as feasible, based on site-specific evaluation and plans.

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## Analysis Areas

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### Direct, Secondary and Cumulative Effects Analysis Area

The analysis area will be the proposed harvest units and road locations. This analysis area encompasses all areas that could be impacted from soil disturbance associated with this project and cumulative impacts due to past activities.

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## Analysis Methods

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### Compaction, Displacement and Erosion

Methods for disclosing impacts include using general soil descriptions and the management limitations for each soil type. This analysis will qualitatively assess the risk of negative effects to soils from erosion, compaction, and displacement from each alternative, using insight from previously collected soils monitoring data from over 90 DNRC post-harvest monitoring projects (*DNRC 2011*).

### Nutrient Cycling and Soil Productivity

If the Action Alternative is selected, recommendations based upon scientific literature as required by ARM 36.11.414 (2) will assist in developing contract requirements and mitigation measures necessary to ensure post-project levels of coarse woody debris (CWD) adequately meet the recommendations of relevant literature, primarily *Graham et.al (1994)*. Fine woody material will be addressed solely through contract language that minimizes removal (*ARM 36.11.410*).

### Slope Stability

Slope stability will be addressed by reviewing landtype information, past analysis, and field notes for potential stability concerns. A qualitative risk assessment of potential impacts will be completed by comparing locations of concern with proposed road locations and harvest units prescriptions.

### Risk Communication

Effective risk management requires assessment of inherently uncertain events and circumstances, typically addressing 2 dimensions: how likely the effect is to occur (probability) and the magnitude of the effect (impact) if it happened (*Hillson and Hulett, 2004*).

In terms of the risk that an impact may occur, a *low risk* of an impact means that the impact is unlikely to occur. A *moderate risk* of an impact means that the impact may or may not occur. A *high risk* of an impact means that the impact is likely to occur.

A *very low impact* means that the impact is unlikely to be detectable or measurable, and the impact is not likely to be detrimental to the resource. A *low impact* means that the impact is likely to be detectable or measurable, but the impact is not likely to be detrimental to the resource. A *moderate impact* means that the impact is likely to be detectable or measurable and the impact is likely to be moderately detrimental to the resource. A *high*



*impact* means that the impact is likely to be detectable or measurable, and the impact is likely to be highly detrimental to the resource.

## Existing Conditions

### Geology

The majority Kootenai National Forest area—including the project area—was covered by continental ice sheets multiple times during the Pleistocene epoch. Therefore, the state managed parcel is predominately glaciated mountain slopes with dense, brittle glacial till under volcanic ash influenced loess surface soils. Several rock outcrops are visible in the parcel.

### Physical Disturbance (Compaction, Displacement and Erosion)

The project area consists of the state parcel which has had limited timber management. In 1988 the first timber access roads for state management were planned. Approximately 1.75 miles were built to access the northeastern and southwestern corners of the parcel and removed about 6.4 acres from timber production. As part of the Poker-Smoke Timber Sale (DNRC 1988), approximately 100 acres was harvested in 1988 to salvage mountain pine beetle killed and mistle-toe infected trees. While reviewing these harvest units in 2016 and 2017 very little compaction or displacement was observed from the previous entries.

**Table S3 – Soil Map Unit Description**

Map Unit	Description	Acres	Analysis Area	Landtype Description	Compaction hazard	Erosion Hazard	Displacement Hazard
102	Lacustrine terraces, silt loam, 0 to 15% slopes	29	4.6%	Dip Slopes - pluvial, mixed sedimentary	M/H	M	M
301/302	Glaciated mountain sideslopes, very gravelly sandy loam 15 to 60% slopes	213	34%	Dip Slopes - pluvial, mixed sedimentary	L	M	M/H
351	Disected glaciated mountain slopes, very gravelly sandy loam, 3 to 60% slopes	14	2.2%	Dip Slopes - mass wasting, mixed sedimentary	L	M	H
355	Rock outcrop complex/glaciated mountain, very gravelly sandy loam, 20 to 50% slopes	371	59.2%	Pluvial Dissection - pluvial, mixed sedimentary	L	M	H

No erosion was noted in the previous harvest units during field reconnaissance. Minor erosion was observed on small areas of cutslopes within the state parcel. Other portions of the haul route on other ownerships showed signs of erosion on large cutslopes. None of these sites delivered sediment to surface water, but will continue to be a maintenance need.

### Nutrient Cycling and Soil Productivity

Coarse and fine woody debris provide a crucial component in forested environments through nutrient cycling, microbial habitat, moisture retention and protection from mineral soil erosion. (Harmon et al 1986). While coarse woody debris decays at various rates due to local climatic conditions, the advanced stages of decay contains many nutrients and holds substantial amounts of moisture for vegetation during dry periods (Larson et

al. 1978, Wicklow et al. 1973). Forest management can affect the volumes of fine and coarse woody debris through timber harvesting and result in changes to the available nutrients for long term forest production.

Considerable woody debris was observed during field reconnaissance. This average is within the recommendations in Managing Coarse Woody Debris in Forests of the Rocky Mountains (Graham et al, 1994) on similar habitat types post timber harvest. Douglas-fir habitat types are recommended to have a level of coarse woody debris in the range of 5 to 24 tons per acre to maintain forest productivity while the present grand fir habitat types are recommended to have 12 to 24 tons per acre.

### **Slope Stability**

Slope stability for the landtypes in the project area is not listed as a concern in the Soil Survey of Kootenai National Forest Area, Montana (Kuennen and Nielsen-Gerhardt, 1995). During reconnaissance for the Poker Smoke Timber Sale (DNRC 1988), marginal stability was noted in some of the draws. The soil scientist noted indicators of potential instability as sharp slope breaks, bedrock strata dipping with the slope, narrow spaced drainages and dense glacial till on steep slopes. Additional indicators noted during field reconnaissance in 2017 is pistol-butted trees in some draw locations.

Along the haul route cutslopes appear to be stable however some areas are have not revegetated since the initial road construction and continue to bleed lacustrine sediments onto the road surface. Revegetation is difficult on some of these sites due to moisture stress.

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## **Environmental Effects**

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### **No Action Alternative: Direct, Secondary, and Cumulative Effects**

Implementation of the no-action alternative would result in no soil resource impacts in the project area. Soil resource condition would remain similar to those described in the existing conditions sections of this environmental assessment.

### **Action Alternative: Direct, Secondary, and Cumulative Effects**

#### **Geology**

##### ***Direct and Secondary & Cumulative***

The geology would remain similar to those described in the existing conditions sections of this environmental assessment.

#### **Physical Disturbance (Compaction, Displacement and Erosion)**

##### ***Direct and Secondary***

Considering data from the DNRC SOIL MONITORING REPORT (DNRC 2011), the implementation of Forestry BMPs has resulted in less risk of detrimental soil impacts from erosion, displacement, and severe compaction. While the report noted that the impacts were more likely on the fine-textured soils and steep slopes, reduced soil productivity due to compaction and displacement can occur on coarser parent materials. Also, the greatest impacts occurred where harvesting implementation departed from BMPs by ground-based skidding on slopes of greater than 40 percent.

Comparing the soil type map, field reconnaissance notes, and topographic map features with the proposed harvest unit map indicates that ground-based skidding would occur on slopes of up to 45 percent. The extent

of expected impacts would likely be similar to those reported in the DNRC SOIL MONITORING REPORT (DNRC 2011), or approximately 13.7 percent of the harvest area for ground-based operations during summer conditions. Monitoring data shows that cable yarding averages approximately 4.5 percent impacts. Therefore, the impacts from this proposal when weighted by harvest type are estimated to be approximately 7 percent.

In addition to impacts within harvest units, new road construction, including temporary roads, essentially removes land from forest production for several decades. The proposal would construct approximately 1.5 miles of new temporary road and 4.2 miles of permanent road. At the close of the project, all temporary roads would be recontoured for at least 200 feet and drainage structures removed. Although the road prism may remain on the landscape, usage of the road would not be feasible because a portion of the road would be recontoured to prevent use by all motorized vehicles. TABLE S4– DETRIMENTAL SOIL DISTURBANCE FOR THE ACTION ALTERNATIVE summarizes the expected impacts to soils within harvest units and area of new road construction including temporary roads.

Some erosion on newly constructed roads would be expected until vegetation is established. Immediate seeding of disturbed areas would improve revegetation success on all landtypes because of moisture stress and low water holding capacity of most soils in the project area. Although there is a high risk of erosion, the impact would be low and through implementation of BMPs the risk of sediment delivery to streams would be low.

Although erosion would potentially result from this alternative, the magnitude, area and duration of erosion and other adverse impacts such as compaction and displacement would remain low. Therefore, the risk of unacceptable adverse direct and indirect impacts to physical soil properties from compaction, displacement and erosion would be low.

### **Cumulative**

As vegetation begins to establish on the impacted areas and freeze-thaw cycles occur, the area of reduced productivity due to skid trails and landings would decrease. Proposed harvest units that have been previously impacted by skid trails and landings would utilize existing trails to minimize additional cumulative impacts. Per the SFLMP goal, the cumulative area of impacts from skid trails and landings would remain less than 15 percent of the harvest area.

By implementing Forestry BMPs and adhering to recommended mitigation measures listed below, DNRC concludes that the risk of unacceptable adverse cumulative impacts as a result of compaction or displacement from this project would be low.

Table S4 – Detrimental Soil Disturbance for the Action Alternative

Area of Analysis	Total Area (Acres)	Disturbance Rate (%)	Affected Area (Acres)
Tractor Harvest Units (including landings)	173	13.7%	23.7
Cable Harvest Units (including landings)	457	4.5%	20.6
Total Cable and Ground Based	630	7%	44.3
Roads *	5.7	100%	20.52

\*Acres in roads are calculated with a 30-foot impact width for the cut slope, fill slope and driving surface. This equates to approximately 3.6 acres per mile of road.

## **Nutrient Cycling and Soil Productivity**

### ***Direct and Secondary***

As required in the DNRC Timber Sale Contract, both fine and coarse woody debris would be retained to reduce potential impacts to forest productivity. Although fine woody debris would be left on site for nutrient retention, a moderate reduction in annual fine material contribution would result from this alternative for up to 20 years. Coarse woody debris would be left on site in volumes recommended to help maintain soil moisture and forest productivity, generally in the 12 to 24 tons per acre range for habitat types found in the harvest locations (*Graham et al. 1994*)

Because coarse woody debris would be left on site in amounts recommended by scientific literature, and fine debris would be maintained as much as practicable, the risk of measurable adverse direct or indirect impacts to nutrient cycling would be low.

### ***Cumulative***

Coarse woody debris would be maintained at levels recommended by *Graham et.al.(1994)* to maintain long-term soil productivity. Although a short-term reduction in fine material would result from this alternative, contract clauses developed from mitigation measures listed below would be expected to minimize long-term impacts until acceptable stocking levels of vegetation is established. For these reasons, a low risk of low cumulative impacts to nutrient cycling and soil productivity would be expected from this alternative.

## **Slope Stability**

### ***Direct and Secondary***

Steep slopes are prevalent throughout the parcel which would require extensive three-quarter or full bench construction in landtypes 301/302 and 355. Indicators of potential slope instability were noted during past site reviews and described in the Poker Smoke Environmental Analysis (DNRC 1988). The same indicators were present during field reconnaissance in 2017 for this project; however, roads constructed on the same landtypes located in the section south of the state parcel showed very little evidence of instability.

If the action alternative were selected, there would be a moderate risk of moderate impacts from slope failures on cutslopes and at incised draws. Slope failures, if they were to occur, may range from small cutslope sloughing onto the road surface or fillslope sloughing into an ephemeral draw. Proper road construction techniques and adequate surface drainage features would reduce the risk impacts.

Timber harvest prescriptions would leave 15 to 25 trees per acre within the harvest units. Grouping the leave trees in incised draws or steep ephemeral draws would provide for continued rooting structure and lessen the risk of instability. Additionally, protecting submerchantable trees and shrubs in draws during harvest operations and from prescribed fire would lessen the risk of slope instability.

### ***Cumulative***

Cumulative impacts to slope stability would be nearly identical to the direct and secondary impacts because the only slope issue identified in the existing condition was chronic bleeding of fine sediments along the haul route. Therefore, this alternative would have a moderate risk of moderate impacts from slope stability.

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## Soils Mitigations

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- 1.) Limit equipment operations to periods when soils are relatively dry, (less than 20 percent oven-dried weight), frozen, or snow-covered in order to minimize soil compaction and rutting, and maintain drainage features. Check soil moisture conditions prior to equipment start-up.
- 2.) On ground-based units, especially on previously harvested areas, the logger and sale administrator would agree to a skidding plan prior to equipment operations. Skid-trail planning would identify which main trails to use and how many additional trails are needed. Trails that do not comply with BMPs (i.e. trails in draw bottoms) would not be used unless impacts can be adequately mitigated. Regardless of use, these trails may be closed with additional drainage installed, where needed, or grass-seeded to stabilize the site and control erosion.
- 3.) Tractor skidding should be limited to slopes of less than 40 percent unless the operation can be completed without causing excessive displacement or erosion. Based on site review, short, steep slopes may require a combination of mitigation measures, such as adverse skidding to a ridge or winchline, and skidding from more moderate slopes of less than 40 percent.
- 4.) Keep skid trails to 20 percent or less of the harvest unit acreage. Provide for drainage in skid trails and roads concurrently with operations.
- 5.) Slash disposal: Limit the combination of disturbance and scarification to 30 to 40 percent of the harvest units. No dozer piling on slopes over 35 percent; no excavator piling on slopes over 40 percent, unless the operation can be completed without causing excessive erosion. Consider lopping and scattering or jackpot burning on the steeper slopes. Consider disturbance incurred during skidding operations to, at least, partially provide scarification for regeneration.
- 6.) Retain 12 to 24 tons of large woody debris and a feasible majority of all fine litter following harvesting operations. On units where whole tree harvesting is used, consider implementing one of the following mitigations to minimize fine litter removal 1) use in-woods processing equipment that leaves slash on site; 2) for whole-tree harvesting, return-skid slash and evenly distribute within the harvest area; or 3) cut tops from every third bundle of logs so that tops are dispersed as skidding progresses. 4) on cable harvest units, monitor limb breakage and lop tops as needed to minimize fine litter removal
- 7.) Protect submerchantable trees and shrubs in draw bottoms from prescribed fire. Focus retention of leave trees in draw bottoms to promote slope stability.

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## Soils References

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## **Attachment C – Water Resources Analysis**



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## Brulee Timber Sale – Water Resources Analysis

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### Analysis Prepared By:

Name: Marc Vessar

Title: Forest Hydrologist, Montana DNRC

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## Introduction

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The following analysis will disclose anticipated effects to water resources within the Smoke Brulee Timber Sale project area. Direct, secondary, and cumulative effects to water resources of both the No-Action and Action alternatives will be analyzed.

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## Issues and Measurement Criteria

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- Timber harvesting and road construction activities may increase sediment delivery into streams and affect water quality.
- Cumulative effects from timber harvest may affect channel stability and fisheries habitat by increasing annual water yields and by decreasing the amount of recruitable woody debris into streams and /or increasing stream temperatures.

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## Regulatory Framework

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The following plans, rules, and practices have guided this projects planning and/or will be implemented during project activities:

### Water Quality Standards

This portion of the Kootenai River basin, including the Fisher River and its tributaries, is classified as B-1 by the Montana Department of Environmental Quality (MDEQ), as stated in ARM 17.30.609. Among other criteria for B-1 waters, no increases are allowed above naturally occurring levels of sediment, and minimal increases over natural turbidity. "Naturally occurring," as defined by *ARM 17.30.602 (19)*, includes conditions or materials present during runoff from developed land where all reasonable land, soil, and water conservation practices (commonly called Best Management Practices or BMPs) have been applied. The State of Montana has adopted BMPs through its non-point source management plan (*MDEQ, 2007*) as the principle means of meeting the Water Quality Standards. Reasonable practices include methods, measures, or practices that protect present and reasonably anticipated beneficial uses. These practices include, but are not limited to, structural and nonstructural controls and operation and maintenance procedures. Appropriate practices may be applied before, during, or after completion of activities that could create impacts.

### Water Quality Limited Waterbodies

None of the streams in the parcel are considered impaired waterbodies and listed on the 2016 303(d) list (*MDEQ 2016*). However, the Fisher River is listed for not fully supporting aquatic life probably due to a streambank modifications-destabilization and channelization from a high flow regime. A TMDL is not required for this impairment.

The 303(d) list is compiled by MDEQ as required by section 303(d) of the Federal Clean Water Act and the Environmental Protection Agency Water Quality Planning and Management Regulations (40 CFR, part 130). Under these laws, MDEQ is required to identify water bodies that do not fully meet water quality standards, and/or where beneficial uses are threatened or impaired.

#### **Streamside Management Zone Law (SMZ)**

All rules and regulations pertaining to the SMZ Law are to be followed. An SMZ width of 100 feet is required on Class 1 and 2 streams and lakes when the slope is greater than 35 percent. An SMZ width of 50 feet is required when the slope is less than 35 percent.

In order to implement practices within the SMZ that are generally prohibited, an alternative practice application must be submitted to a DNRC Public Assistance Forester for approval.

#### **Forest Management Rules**

In 2003, DNRC drafted Administrative Rules for Forest Management. The portion of those rules applicable to watershed and water resources include ARM 36.11.422 through 426 and 470 through 471.

#### **Habitat Conservation Plan (HCP)**

DNRC is managing the habitats of threatened and endangered species on this project by implementing the Montana DNRC Forested Trust Lands Habitat Conservation Plan (HCP) and the associated Incidental Take Permit that was issued by the United States Fish & Wildlife Service (USFWS) in February of 2012 under Section 10 of the Endangered Species Act. The HCP identifies specific conservation strategies for managing the habitats of grizzly bear, Canada lynx, and three fish species: bull trout, westslope cutthroat trout, and Columbia redband trout. This project complies with the HCP, which can be found at <http://dnrc.mt.gov/HCP>.

#### **Water Rights And Beneficial Uses**

Water rights for surface water one miles downstream of the project area includes irrigation and stock watering. Groundwater water right for domestic use are also present.

Designated beneficial water uses within the project area include cold-water fisheries, aquatic life support, and recreational use in the streams, wetlands, and lakes in the surrounding areas.

#### **Fisheries—Threatened, Endangered And Sensitive Species**

Westslope cutthroat trout are listed as a Class-A Montana Animal Species of Concern. A Class-A designation is defined as a species or subspecies that has limited numbers and/or habitats both in Montana and elsewhere in North America, and elimination from Montana would be a significant loss to the gene pool of the species or subspecies (Montana Fish, Wildlife and Parks, Montana Natural Heritage Program, and Montana Chapter American Fisheries Society Rankings). DNRC has also identified westslope cutthroat trout as a sensitive species (ARM 36.11.436).

Bull trout are also listed as a Montana Animal Species of Concern, with the same ranking as westslope cutthroat trout; however bull trout are also listed as ‘threatened’ by the US Fish and Wildlife Service under the Endangered Species Act. DNRC is a signatory to the 2000 (interagency) Restoration Plan for Bull Trout in the Clark Fork River Basin and Kootenai River Basin, Montana.

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## **Analysis Areas**

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### **Sediment Delivery**

The analysis area for sediment delivery is the proposed harvest units and roads used for hauling. This includes upland sources of sediment that could result from this project. In addition, in-channel sources of sediment such as mass-wasting locations or excessive scour/deposition will be disclosed if found in project area streams.

#### **Water Yield**

The unnamed stream draining the majority of the parcel will be the water yield analysis area.. The Class 2 stream does not connect to a downstream waterbody. Smaller portions of the parcel drain into Brulee Creek to the south and Smoke Creek to the north. These watersheds will also be included in the Water Yield analysis area.

#### **Woody Debris Recruitment**

The analysis area for woody debris recruitment is the riparian management zone (RMZ) along Class 1 streams in the project area.

#### **Stream Temperature Increases**

The analysis area for stream temperature increases is identical to the analysis area for woody debris recruitment.

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## **Analysis Methods**

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#### **Risk Assessment Description**

In terms of the risk that an impact may occur, a low risk of an impact means that the impact is unlikely to occur. A moderate risk of an impact means that the impact may or may not (50/50) occur. A high risk of an impact means that the impact is likely to occur.

A *very low impact* means that the impact is unlikely to be detectable or measurable, and the impact is not likely to be detrimental to the resource. A *low impact* means that the impact is likely to be detectable or measurable, but the impact is not likely to be detrimental to the resource. A *moderate impact* means that the impact is likely to be detectable or measurable, and the impact is likely to be moderately detrimental to the resource. A *high impact* means that the impact is likely to be detectable or measurable, and the impact is likely to be highly detrimental to the resource.

#### **Sediment Delivery**

The methods applied to the project area to evaluate potential direct, indirect, and cumulative effects include a field review of potential sediment sources from haul routes. Stream crossings and roads were evaluated to determine existing sources of introduced sediment from existing and proposed roads.

Potential sediment delivery from harvest units will be evaluated from a risk assessment. This risk assessment will use the soil information provided in the SMOKE BRULEE SOILS ANALYSIS and the results from soil monitoring on past DNRC timber sales.

Sediment sources from in-channel sources will be addressed qualitatively by identifying stream segments with atypical levels of instability and assessing the risk of adverse impacts from each alternative using the Risk Assessment Descriptions above.

#### **Water Yield**

Potential impacts from increases in annual water yield will be discussed primarily qualitatively in this document for the main channel that flows south-to-north through the parcel. Because very little of the parcel is tributary to Smoke Creek (18 acres); Brulee Creek (26 acres); or, the small unnamed tributary on the western side of

the parcel (73 acres), and no defined channels were observed on the state parcel that contribute to these streams no further discussion will be completed.

Visual inspection of runoff patterns and stream channel stability in the project area along with aerial photo interpretation and past analyses will be used to determine the impacts and extent of past management in the analysis area. The discontinuous and intermittent characteristic of streams in the project area diminishes the potential impacts from channel forming events.

### **Woody Debris Recruitment**

The analysis method for woody debris recruitment will evaluate the potential reduction in available woody debris and shading due to timber-harvesting activities in the riparian management zone (RMZ) of Class 1 streams in the project area.

### **Stream Temperature Increases**

Stream temperature will be addressed by comparing the existing condition with the proposed harvest prescriptions to assess the risk of stream temperature increases in Class 1 streams within the project area.

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## **Existing Conditions**

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### **General Description**

The watershed that drains the majority of the state parcel is approximately 873 acres. The average annual precipitation is 37.9" per year, mainly in the form of snow. Ownership within this watershed is 59% State of Montana, 22% Weyerhaeuser Timber Company and 19% USDA Forest Service. Approximately 2.7 miles or of forest road currently exists across all ownerships with one stream crossings near the bottom of the watershed. No fish were observed during field reconnaissance, and due to the spatially disconnected characteristic of the stream, it is unlikely that fish have ever been present.

For general information in the area, Smoke Creek and Brulee Creek both contain westslope cutthroat trout while the Fisher River contains brook trout, bull trout, kokanee, largescale sucker, longnose dace, longnose sucker, mountain whitefish, northern pike minnow, rainbow trout, redband X westslope cutthroat, redband shiner, sculpin, westslope X redband X coastal rainbow.

### **Sediment Delivery**

The parcel has approximately 2.1 miles of stream within its boundaries: 0.6 miles of non-fish bearing Class 1 stream and 1.5 miles of discontinuous Class 2 stream. Currently there are no stream crossings within the state parcel, however an older ford was observed near the northern boundary.

Much of the stream was dry as of June 15, 2017; areas that were still flowing water were nearing base flow. Channel conditions throughout the parcel generally stable with small areas of eroded banks, mainly at animal crossings, outcrops or constrictions. The channel substrate is quite stable and consists of angular rock.

Roads along the proposed haul route have been brought up to Forestry BMP standards on previous entries by private landowners and federal agencies. No substantial sediment delivery sites were identified during road inventory. However, a few crossing structures need maintenance to minimize the risk of plugging in future spring runoff events. This maintenance generally consists of removing debris and brush that is partially blocking structures.

### **Water Yield**

Using 2013 NAIP layers, approximately 248 acres has been harvested in the watershed. Channel characteristics described above indicate that the channel is in good condition and does not show evidence of adverse impacts from high flow events. Field reconnaissance and aerial photos indicate that all previous harvest areas are fully stocked with sapling or larger trees.

### **Woody Debris Recruitment**

Large woody debris recruitment to streams is important to maintain channel form and function. One reason for the RMZs is to retain adequate levels of large woody debris recruitment to the stream channel. Site potential tree height (SPTH) at 100 years is the method used to identify RMZ width according to ARM 36.11.425 (5). After collecting tree height and age data along the streams in the state parcel, the average SPTH<sub>100</sub> in the project area was determined to be 138 feet for Class 1 streams.

Approximately 0.6 miles of Class 1 stream is within the project area. A review of DNRC harvest history and the 2013 NAIP layers using GIS shows that no harvest has occurred in the riparian area.

### **Stream Temperature Increases**

Because no harvest has occurred in the riparian area of the Class 1 stream, the stream temperature regime would be considered a natural.

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## **Environmental Effects**

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### **No Action Alternative: Direct, Secondary, and Cumulative Effects**

#### **Sediment Delivery**

##### ***Direct and Secondary***

Under this alternative, no timber harvesting or related activities would occur. Water Quality would continue as described in the existing conditions.

##### ***Cumulative***

No additional cumulative impacts to water quality would be expected. Sediment delivery sites from roads on the proposed haul routes would remain unchanged, as would the sediment sources described in Existing Conditions.

#### **Water Yield**

##### **Direct and Secondary**

No increased risk of increases or reductions in annual water yield or ECA would result from this alternative.

##### **Cumulative**

No increase in water yield would be associated with this alternative. As vegetation continues toward a fully forested condition, annual water yields would also be expected to gradually decline.

#### **Woody Debris Recruitment**

##### ***Direct, Secondary and Cumulative***

Under this alternative, no timber harvesting or related activities would occur. Available woody debris would remain as described in the existing conditions.

#### **Stream Temperature Increases**

##### ***Direct, Secondary and Cumulative***

Under this alternative, no timber harvesting or related activities would occur. Shading would continue maintain a natural stream temperature regime.

### **Action Alternative: Direct, Secondary, and Cumulative Effects**

#### **Sediment Delivery**

##### ***Direct and Secondary***

Proposed harvest and site preparation would follow all Forestry BMPs to minimize the risk of erosion, slope instability and sediment delivery. SMZ harvest would be implemented on up to 31.6 acres and would follow all SMZ law conditions. Access to the harvest units would be implemented by constructing 5.7 miles of new road: 4.2 miles of permanent road and 1.5 miles of temporary road. Five new stream crossings would be installed during the road construction; four would be permanent culverts sized for a 50-year event and one would be a temporary bridge. Road maintenance would be required to ensure drainage features are functional during and after project implementation.

Forestry BMPs would be employed during the road construction, maintenance and timber harvest to minimize the risk of sediment delivery to stream. Additionally, all requirements of the Stream Protection Act (124 permit) would be followed. However, a high risk of low impacts from sediment delivery would be expected until stream crossing locations are vegetated.

##### ***Cumulative***

The high risk of low impacts from sediment delivery would be short-term impacts and would subside as vegetation reestablishes. Because Forestry BMPs would be incorporated into the timber sale design and roadwork activities with this project and the discontinuous stream characteristics a low risk of low long-term cumulative impacts to downstream waterbodies would be expected from sediment delivery if this alternative were selected.

#### **Water Yield**

##### ***Direct and Secondary***

Approximately 500 acres would be harvested with a shelterwood prescription within the unnamed discontinuous watershed. This equates to about 57 percent of the watershed area. With the removal of trees from the landscape, additional water would be available for runoff into the stream and the wind patterns would likely increase the snowmelt rate. This combination would be expected to increase the streamflow during early spring.

The potential for additional flow in the spring would have a moderate risk of moderate impacts to the stream channel. Impacts may include increase erosion at constrictions such as meander corners or debris jams. To reduce the risk of erosion, the SMZ law would be followed including tree retention requirements that favor maintaining bank edge trees. The retention of bank edge trees would provide protection from erosive high flows.

##### ***Cumulative***

Cumulative impacts from increases in water quantity would be a combination of the existing conditions with the direct and secondary impacts. Because the channel is stable at this time, the potential increase in streamflow during spring runoff would have moderate risk of moderate impacts as a result of the proposal.

#### **Woody Debris Recruitment**

##### ***Direct, Secondary and Cumulative***

Under this alternative, approximately 13.1 acres of RMZ along the Class 1 stream would be harvested with up to 50 percent of the trees  $\geq 8$  inches diameter removed. No harvest would occur within 50 feet of a Class 1 stream. Because no previous harvest or removal of trees within the RMZ has been implemented, the direct/secondary and cumulative impacts are the same. A moderate risk of low impacts to woody debris recruitment and would be expected from this alternative. The implementation of this alternative would be expected to continue providing adequate woody debris recruitment to the stream for maintaining its current form and function.

### **Stream Temperature Increases**

#### ***Direct and Secondary***

Through implementation of the SMZ Law and Rules and Forest Management ARMs for RMZs along Class 1 streams, no timber harvest within 50 feet of Class 1 streams would be implemented. Within the remainder of the 138-foot RMZ along project area Class 1 stream, up to 50 percent of the trees  $\geq 8$  inch dbh harvested. This prescription is expected to result in a minimal loss of stream shading. The consequent impact to stream temperatures in the project area is also expected to be very low.

#### ***Cumulative***

Due to the limited amount of shade-producing vegetation that would be removed, a low risk of cumulative temperature increases above naturally-occurring ranges would result from the implementation of this alternative.

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## **Water Resources Mitigations**

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Hydrologic related resource mitigations that would be implemented with the proposed Action Alternative include:

- Use all applicable Forestry BMPs.
- Follow Soils Analysis mitigations above.

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## **Water Resources References**

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- USFWS and DNRC. 2010. Montana Department of Natural Resources and Conservation Forested Trust Lands Habitat Conservation Plan, Final Environmental Impact Statement, Volumes I and II. U.S. Department of Interior, Fish and Wildlife Service, Region 6, Denver, Colorado, and Montana Department of Natural Resources and Conservation, Missoula, MT. September 2010.
- Wenger, S. 1999. A review of the scientific literature on riparian buffer width, extent, and vegetation. Publication of the Office of Public Service and Outreach, Institute of Ecology, University of Georgia.





## **Attachment D – Wildlife Analysis**

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## Smoke-Brulee Timber Sale – Wildlife Analysis

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### Analysis Prepared By:

**Name:** Leah Breidinger

**Title:** Wildlife Biologist, Montana DNRC

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## Introduction

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The following analysis will disclose the anticipated direct, secondary, and cumulative effects to wildlife associated with the No-Action and Action alternatives.

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## Issues

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- *Mature forest cover and connectivity.* The proposed activities could decrease mature forested cover, which could reduce habitat connectivity and suitability for wildlife species associated with mature forests.
  - *Old-growth forests.* The proposed activities could affect wildlife species associated with old-growth forests by reducing habitat availability and increasing fragmentation.
  - *Canada lynx.* The proposed activities could reduce landscape connectivity and the availability of suitable Canada lynx habitat, reducing the capacity of the area to support Canada lynx.
  - *Grizzly bears.* The proposed activities could affect grizzly bear cover, affect important habitat, and increase human access, which could adversely affect bears by displacing them from important habitat, and/or by increasing risk of human-caused bear mortality.
  - *Fishers.* The proposed activities could reduce the availability and connectivity of suitable fisher habitat and increase human access, which could reduce fisher habitat suitability and increase trapping mortality.
  - *Flammulated owls.* The proposed activities could alter the structure of flammulated owl preferred habitat, which could reduce habitat suitability for flammulated owls.
  - *Pileated woodpeckers.* The proposed activities could reduce tree density and alter the structure of mature forest stands, which could reduce habitat suitability for pileated woodpeckers.
  - *Big game winter range.* The proposed activities could reduce cover, which could reduce the quality of big game winter range habitat.
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## Regulatory Framework

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The following plans, rules, and practices have guided this project's planning and/or will be implemented during project activities: *DNRC Forest Management Rules*, *DNRC Forested Trust Lands Final Environmental Impact Statement and Habitat Conservation Plan (USFWS and DNRC 2010)*, *the Endangered Species Act*, *the Migratory Bird Treaty Act*, and *the Bald and Golden Eagle Protection Act*.

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## Analysis Areas

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### Direct and Secondary Effects Analysis Area

The direct and secondary effects of the proposed activities on all species/issues were analyzed within the Project Area (*TABLE WI-1, FIGURE WI-1*).

### Cumulative Effects Analysis Areas

The cumulative effects of the proposed activities on all species/issues were analyzed at a broad surrounding landscape scale that varies according to the issue or wildlife species being discussed. Cumulative effects analysis areas are named according to the size of the area and are summarized in *TABLE WI-1* and *FIGURE WI-1*. Cumulative effects analysis areas (CEAAs) include the Project Area as well as lands managed by other agencies and private landowners. The USFS and Weyerhaeuser manages 43% and 50% of the Medium CEAA, respectively and 55% and 37% of the Large CEAA, respectively. Most both analysis areas are managed for timber production, with a few private residences located along the Fisher River. The elevation of the CEAAs ranges from 2,840 to 5,880 feet. Detailed descriptions of each analysis area are located in the affected environment section for each issue or species evaluated (e.g., pileated woodpecker etc.).

**Table WI-1– Descriptions of the Project Area and cumulative effects analysis areas.**

Analysis Area Name	Description	Total Acres	Issues/Species Analyzed
Project Area	DNRC managed lands in Section 16 T27N R29W	635	Direct & secondary effects for all issues/species
Medium CEAA	The Project Area and surrounding sections; defined by streams, ridgelines, and topographic features	8,243	mature forest cover & connectivity, old-growth forests, pileated woodpeckers, flammulated owls, fishers, big game winter range
Large CEAA	The Upper Fisher River Subwatershed and portions of the West Fisher Creek Watershed	31,555	Canada lynx, grizzly bears

## Analysis Methods

Analysis methods are based on the DNRC State Forest Land Management Plan, which is designed to promote biodiversity. The primary basis for this analysis includes information obtained by: field visits, review of scientific literature, Montana Natural Heritage Program (MNHP) data queries, DNRC Stand Level Inventory (SLI) data analysis, aerial photograph analysis, and consultation with professionals. The coarse-filter wildlife analysis section includes analyses of the direct, secondary, and cumulative effects of the proposed alternatives on old-growth forest, connectivity of mature forest habitats, and snags and coarse woody debris.

In the fine-filter analysis, individual species of concern are evaluated. These species include wildlife species federally listed under the Endangered Species Act, species listed as sensitive by DNRC, and species managed as big game by the Montana Department of Fish Wildlife and Parks (DFWP).

Cumulative effects analyses account for known past and current activities, as well as planned future agency actions. Timber sales that occurred on other ownerships are accounted for in analyses of aerial photographs. Proposed timber sales on other ownerships and recent DNRC timber sale projects (≤10 years) that could contribute to cumulative effects are summarized in the following table (*USFS 2017*).

**Table WI-2 – Recent projects and known proposed projects that could contribute to cumulative effects and the number of harvested acres that occur in each analysis area. Values in parentheses indicate the percentage (%) of area the respective lands represent of the each analysis area listed in the table.**

Sale Name	Agency	Harvest Year	Project Area	Medium CEAA	Large CEAA
Smoke-Brulee	DNRC	Proposed (~2017-2020)	630 (99.1%)	630 (7.6%)	630 (2.0%)

Coyote Springs Improvement	USFS	Proposed	0	0	250 (0.8%)
Total	-	-	630 (99.1%)	630 (7.6%)	880 (2.8%)

## Coarse Filter Wildlife Analysis

### MATURE FOREST COVER AND CONNECTIVITY

#### Issue

The proposed activities could decrease mature forested cover, which could reduce habitat connectivity and suitability for wildlife species associated with mature forests.

#### Introduction

Mature forests characterized by large-diameter trees and dense canopy cover provide many wildlife species with food, shelter, breeding sites, and travel corridors. Historically, the spatial configuration of mature forested habitat in the western United States was shaped by natural disturbance, primarily wildfire, blowdown, and pest outbreaks. These events resulted in a mosaic-like spatial configuration of forest patches varying in age, species composition, and development. Spatial configuration, including patch size and connectivity of forested habitat, is important for many wildlife species. Patch size may affect the distribution of wildlife species that are attracted to, or avoid forest edges. Additionally, connectivity of mature forested habitat may facilitate movements of wildlife species that avoid openings in canopy cover. For example, discontinuous mature forested habitat would negatively affect movements of fisher, which avoid large openings in canopy cover. Timber harvest, like wildfire and blowdown, is a disturbance event that often creates open patches of young, early-successional habitats. Forest management considerations for wildlife species dependent on mature forested habitat include providing well-connected patches of habitat with  $\geq 40\%$  canopy cover.

#### Analysis Area

The analysis area for direct and secondary effects is the Project Area and the analysis area for cumulative effects is the 8,243-acre Medium CEAA as described in *TABLE W-1* and depicted in *FIGURE W-1*. The Medium CEAA is defined by geographic features and provides a reasonable analysis area to assess the impact of the proposed activities on wildlife species in the vicinity of the Project Area.

#### Measurement Criteria

Factors considered in the analysis include: 1) the degree of timber harvesting, 2) availability and patch size of mature forested habitat ( $\geq 40\%$  canopy cover, trees  $> 9$  inches dbh average), 3) open and restricted road density, and 4) the availability of potential travel corridors. Mature forested habitat is defined here and in the remainder of the document as forest stands with  $\geq 40\%$  canopy cover comprised primarily of trees that are on average  $> 9$  inches dbh. Forested stands containing trees of at least this size and density were considered adequate for providing minimal conditions necessary to facilitate movements of wildlife species that benefit from well-connected mature forest conditions.

#### Affected Environment

The Project Area currently contains approximately 504 acres of mature stands composed primarily of Douglas-fir stands and mixed western larch and Douglas-fir stands. Riparian areas contain higher proportions of grand fir and hemlock (*TABLE WI-3*, *FIGURE WI-2*). This habitat is continuous, thus connectivity of mature forests for wildlife is high across the Project Area. The Project Area does not occur in any particular area of documented importance for habitat connectivity; however, the Fisher River is less than a mile from the Project Area and is likely to provide a travel corridor for wildlife. There are no open roads present in the Project Area, increasing habitat quality for wildlife.

The Medium CEAA consists primarily of Weyerhaeuser lands (50% of MCEAA) and USFS lands (43%). Overall, the proportion of mature forested habitat is low with most habitat located on USFS lands in the Smoke Creek Drainage (*TABLE WI-3*). Connectivity of mature forested habitat is high in the Smoke Creek Drainage and connectivity near the Project Area is high; however, connectivity is low in the southern portion of the CEAA (*FIGURE WI-2*). Open road density is high in the Medium CEAA at 3.4 miles/square mile, likely reducing connectivity for wildlife species that avoid roads.

**Table WI-3— Average patch size and acreage of mature forested habitat ( $\geq 40\%$  canopy cover,  $>9$  inches dbh) pre- and post-harvest in the Project Area and Medium CEAA for the Smoke-Brulee Timber Sale. Percent of the total corresponding analysis area is in parentheses.**

Mature Forest Attribute	Project Area		Medium CEAA	
	Existing	Post-Harvest	Existing	Post-Harvest
Acres of mature forest	504 (79.4%)	39 (6.2%)	3,065 (37.2%)	2,599 (31.5%)
Average patch size (acres)	252	39	79	63
Number of patches	2	1	40	40

#### **Environmental Effects – Mature Forest Cover and Connectivity**

##### **No Action Alternative: Direct, Secondary, and Cumulative Effects**

None of the proposed forest management activities would occur on DNRC lands. In the short-term, no changes to the amount, quality, or spatial arrangement of mature forested habitat would occur. In the long-term and in the absence of natural disturbance, the availability and connectivity of mature forested wildlife habitat may increase as stands age.

##### **Action Alternative: Direct and Secondary Effects**

The proposed activities would occur in 503 (99.8%) of the 504 acres of mature stands available in the Project Area, some of which would continue providing mature forested habitat, albeit at a reduced stand density (*TABLE WI-3*, *FIGURE WI-2*). Most these acres would be treated with a shelterwood treatment which would retain 20-25% mature canopy cover post-harvest. Approximately 39 acres of riparian habitat associated with stream SMZs and travel corridors in the Project Area would be harvested, but vegetation retention measures would apply and canopy cover in these areas would retain  $>40\%$  canopy cover. Overall, connectivity of upland mature canopy forest within the Project Area would be reduced considering the regeneration treatment that is proposed. However, a 300-foot wide travel corridor would remain along an unnamed tributary to the Fisher River providing an area with cover for wildlife to travel through the parcel. Approximately 4.2 miles of road restricted to motorized public use would be constructed. Motorized administrative use and non-motorized public would be permitted on these roads. Thus, since: 1) the abundance of mature forested habitat would decrease by 465 acres (92.2% of existing mature forest); 2) connectivity would be reduced but a 300-foot travel corridor would be retained; and 3) 4.2 miles of new road would be constructed, but all roads in the Project Area would be closed to motorized public use post-harvest; high adverse direct or secondary effects to mature forested habitat abundance, suitability, or connectivity would be anticipated as a result of the Action Alternative.

##### **Action Alternative: Cumulative Effects**

The proposed activities would affect 503 acres of the 3,065 acres (16.4%) of mature forested habitat available in the Medium CEAA. Post-harvest most of these acres would not provide mature forested habitat for wildlife, causing average patch size to decrease (*TABLE WI-3*, *FIGURE WI-2*). Reductions in the availability of suitable mature forested habitat would be additive to harvest activities that are proposed or ongoing in the Medium CEAA, although DNRC is unaware of any projects at this time. Overall, connectivity of upland mature forest would be reduced; however, travel along the unnamed tributary to the Fisher River would remain

possible due to the retention of a 300-foot wide corridor. Approximately 4.2 miles of road restricted to motorized public use would be constructed. Motorized administrative use and non-motorized public would be permitted on these roads. Thus, since: 1) the abundance of mature forested habitat in the Medium CEAA would decrease by 465 acres (15.2% of existing mature forest); 2) mature forest fragmentation would increase (*TABLE WI-3, FIGURE WI-2*); and 3) 4.2 miles of new road restricted to motorized administrative use and non-motorized public use would be constructed; moderate adverse cumulative effects to mature forested habitat abundance, suitability, or connectivity would be anticipated as a result of the Action Alternative.

## **OLD-GROWTH FORESTS**

### **Issue**

The proposed activities could affect wildlife species associated with old-growth forests by reducing habitat availability and increasing fragmentation.

### **Introduction**

Old-growth forests are an important component of biological diversity. Old-growth forest stands typically contain various combinations of large old trees, abundant snags and downed logs, and multiple canopy layers, which are typically not found in young forests. These attributes provide structures used by a diversity of wildlife species. The diversity of species and the complexity of interactions between them can be different than in earlier successional stages (*Warren 1990*). Of the 48 old-growth associated species occurring in the Northern Rockies, about 60% may require stands larger than 80 acres (*Harger 1978*). Smaller patches may be unsuitable for wildlife species with large home ranges. Additionally, small, less-mobile species may be at greater risk of local extinction in small patches/habitat islands. Timber harvest can affect the size, availability, and spatial juxtaposition of old-growth stands.

### **Analysis Area**

The analysis area for direct and secondary effects is the Project Area and the analysis area for cumulative effects is the 8,243-acre Medium CEAA as described in *TABLE W-1* and depicted in *FIGURE W-1*. The Medium CEAA is defined by geographic features and provides a reasonable analysis area to assess the impact of the proposed activities on wildlife species in the vicinity of the Project Area.

### **Measurement Criteria**

Old-growth forest stands were identified as described in the Vegetation Analysis. Factors considered in the analysis include: 1) the level of harvesting, 2) the abundance of old-growth, and 3) the abundance of patches >80 acres.

### **Affected Environment**

The Project Area contains one old-growth patch that is approximately 58 acres (9.2% of Project Area) (*Green et al. 1992*). No old-growth stands >80 acres are present in the Project Area. This old-growth patch adjacent to stands with ≥40% canopy cover and an average tree diameter of >9 inches dbh (*FIGURE WI-2*).

The Medium CEAA contains 58 acres of old-growth stands on DNRC-managed lands and an additional 1,610 acres of stands with trees that are 15 inches dbh or larger and may meet old-growth definitions (20.2% of Medium CEAA) (*USFS vmap data v11*). The availability of old-growth in the Medium CEAA is likely low considering the low availability of mature forest. Considering that open road density is moderate at 1.6 miles per square mile, old-growth attributes such as snags have likely been removed in high road density areas.

### **Environmental Effects – Old-growth Forests**

#### **No Action Alternative: Direct, Secondary, and Cumulative Effects**

No changes to the amounts, quality, or spatial arrangement of old-growth would occur on DNRC lands under this Alternative. Thus, no direct, secondary, or cumulative effects associated with the abundance or fragmentation of old-growth forests would be anticipated as a result of the No-Action Alternative.

### Action Alternative: Direct and Secondary Effects

All of the old-growth forest acres in the Project Area may be affected by the proposed activities, depending upon the accessibility of the stands in the bottom of the class two stream. Of these acres, 30 acres would be treated with a shelterwood cut and would not retain enough large trees per acre to continue providing old-growth habitat post-harvest. The remaining 28 acres located in the connectivity corridor would be treated with a lighter cut and would continue providing old-growth habitat post-harvest, albeit at a reduced stand density. Logging would alter some structural attributes of these old-growth stands and could adversely affect some old-growth-associated species, particularly those preferring dense forest stands; patch size would decrease to 28 acres. Thus, since 1) the availability of old-growth would be reduced by 30 acres (51.7% of existing old-growth stands); 2) stand density would decrease on 28 acres (48.3% of existing old-growth stands), which may affect wildlife species that prefer dense old-growth stands; and 3) the abundance of old-growth patches >80 acres would not change; moderate adverse direct and secondary effects associated with the abundance or fragmentation of old-growth forests would be anticipated as a result of the Action Alternative.

### Action Alternative: Cumulative Effects

Approximately 58 acres of old-growth habitat in the Medium CEAA would be affected by the proposed activities (3.5% of the 1,669 acres of old-growth and mature stands). Approximately 30 of these acres would not be considered old-growth post-harvest due to logging activities, while 28 acres would continue providing old-growth habitat post-harvest, albeit at a reduced stand density. The availability of old-growth stands larger than 80 acres would not change. Changes in structural attributes of old-growth would be additive to ongoing forest management activities in the Medium CEAA, although DNRC is not aware of any projects at this time. Thus, since: 1) old-growth availability would be reduced by 30 acres (1.8% of mature stands) 2) stand density would decrease on 28 acres, which may affect wildlife species that prefer dense old-growth stands (1.7% of mature stands); and 3) the abundance of patches >80 acres would not be affected; minor adverse cumulative effects associated with the abundance or fragmentation of old-growth forests would be anticipated as a result of the Action Alternative.

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## Fine Filter Wildlife Analysis

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In the fine-filter analysis, individual species of concern are evaluated. These species include those listed as threatened or endangered under the Endangered Species Act of 1973, species listed as sensitive by DNRC, and animals managed as big game by Montana DFWP. *TABLE WI-4* –provides an analysis of the anticipated effects for each species.

**Table WI-4 –Anticipated Effects of the Smoke-Brulee Timber Sale on wildlife species.**

Species/Habitat	[Y/N] Potential Impacts and Mitigation Measures N = Not Present or No Impact is Likely to Occur Y = Impacts May Occur (Explain Below)
<b>Threatened and Endangered Species</b>	
<b>Grizzly bear</b> ( <i>Ursus arctos</i> ) Habitat: Recovery areas, security from human activity	[N] The Project Area is considered non-recovery occupied habitat associated with the Cabinet-Yaak Ecosystem (CYE) ( <i>Wittinger 2002</i> ).
<b>Canada lynx</b> ( <i>Felix lynx</i> ) Habitat: Subalpine fir habitat types, dense sapling, old forest, deep snow zone	[Y] <b><i>Detailed Analysis Provided Below.</i></b> The Project Area contains approximately 292 acres of suitable lynx habitat.
<b>Sensitive Species</b>	

Species/Habitat	[Y/N] Potential Impacts and Mitigation Measures N = Not Present or No Impact is Likely to Occur Y = Impacts May Occur (Explain Below)
<b>Bald eagle</b> <i>(Haliaeetus leucocephalus)</i> Habitat: Late-successional forest < 1 mile from open water	[Y] The Project Area is located within the home range of a bald eagle pair associated with the Fisher River. Given the distance between the nest and the harvest units and that the Fisher River is not adjacent to the Project Area eagle use of the area is likely minimal. However, prominent snags would be retained for perch sites. Thus, negligible direct, secondary, or cumulative effects to bald eagles would be expected to occur as a result of either alternative.
<b>Black-backed woodpecker</b> <i>(Picoides arcticus)</i> Habitat: Mature to old burned or beetle-infested forest	[N] No recently (<5 years) burned areas occur within 0.25 miles of the Project Area. Thus, no direct, secondary, or cumulative effects to black-backed woodpeckers would be expected to occur as a result of either alternative.
<b>Coeur d'Alene salamander</b> <i>(Plethodon idahoensis)</i> Habitat: Waterfall spray zones, talus near cascading streams	[N] No moist talus or streamside talus habitat occurs in the Project Area. Thus, no direct, secondary, or cumulative effects to Coeur d'Alene salamanders would be expected to occur as a result of either alternative.
<b>Columbian sharp-tailed grouse</b> <i>(Tympanuchus Phasianellus columbianus)</i> Habitat: Grassland, shrubland, riparian, agriculture	[N] No suitable grassland communities occur in the Project Area. Thus, no direct, secondary, or cumulative effects to Columbian sharp-tailed grouse would be expected to occur as a result of either alternative.
<b>Common loon</b> <i>(Gavia immer)</i> Habitat: Cold mountain lakes, nest in emergent vegetation	[N] No suitable lake habitat occurs within 500 feet of the Project Area. Thus, no direct, secondary, or cumulative effects to common loons would be expected to occur as a result of either alternative.
<b>Fisher</b> <i>(Martes pennanti)</i> Habitat: Dense mature to old forest less than 6,000 feet in elevation and riparian	[Y] <b>Detailed Analysis Provided Below</b> – Approximately 289 acres of suitable fisher habitat occur within the Project Area.
<b>Flammulated owl</b> <i>(Otus flammeolus)</i> Habitat: Late-successional ponderosa pine and Douglas-fir forest	[Y] <b>Detailed Analysis Provided Below</b> – Approximately 343 acres of flammulated owl habitat types occur in the Project Area.
<b>Gray Wolf</b> <i>(Canis lupus)</i> Habitat: Ample big game populations, security from human activities	[N] Wolves may use habitat near the Project Area. Disturbance associated with timber sales at den and rendezvous locations can adversely affect wolves; however, timing restrictions would apply if den or rendezvous sites are documented ( <i>ARM 33.11.430(1)(a)(b)</i> ). Thus, negligible adverse direct, secondary, or cumulative effects to wolves would be anticipated as a result of the Action Alternative. No direct, secondary, or cumulative effects would be anticipated as a result of the No Action Alternative.
<b>Harlequin duck</b> <i>(Histrionicus histrionicus)</i> Habitat: White-water streams, boulder and cobble substrates	[N] No suitable stream habitat occurs near the Project Area. Thus, no direct, secondary, or cumulative effects to harlequin ducks would be expected to occur as a result of either alternative.
<b>Northern bog lemming</b> <i>(Synaptomys borealis)</i> Habitat: Sphagnum meadows, bogs, fens with thick moss mats	[N] No suitable wetlands occur within the Project Area. Thus, no direct, secondary, or cumulative effects to northern bog lemmings would be expected to occur as a result of either alternative.



Species/Habitat	[Y/N] Potential Impacts and Mitigation Measures N = Not Present or No Impact is Likely to Occur Y = Impacts May Occur (Explain Below)
<b>Northern goshawk</b> ( <i>Accipiter gentilis</i> ) Habitat: Mature stands with open understory for nesting	[Y] Adult goshawks were observed nesting along the haul route on USFS land near Smoke Creek in May of 2017. Motorized activities associated with logging would be prohibited from April 1-August 15 on this road to reduce disturbance to the nesting birds as per requirements of the TRUP with the USFS. Timing restrictions may be reduced if the birds fledge early or if the territory is unoccupied. Thus, considering that timing restrictions would be implemented to reduce potential for disturbance, negligible adverse direct, secondary, or cumulative effects to northern goshawks would be anticipated as a result of the Action Alternative. No direct, secondary, or cumulative effects would be anticipated as a result of the No Action Alternative.
<b>Peregrine falcon</b> ( <i>Falco peregrinus</i> ) Habitat: Cliff features near open foraging areas and/or wetlands	[N] Suitable nesting cliffs were not observed near the Project Area and peregrine eyries have not been reported in the area ( <i>MNHP data, June 28, 2017</i> ). Thus, no direct, secondary, or cumulative effects to peregrine falcons would be anticipated as a result of either alternative.
<b>Pileated woodpecker</b> ( <i>Dryocopus pileatus</i> ) Habitat: Late-successional ponderosa pine and larch-fir forest	[Y] <b>Detailed Analysis Provided Below</b> – Approximately 555 acres of pileated woodpecker habitat occur in the Project Area.
<b>Townsend's big-eared bat</b> ( <i>Plecotus townsendii</i> ) Habitat: Caves, caverns, old mines	[N] No suitable caves or mine tunnels are known to occur in the Project Area. Thus, no direct, secondary or cumulative effects to Townsend's big-eared bats would be expected to occur as a result of either alternative.
<b>Wolverine</b> ( <i>Gulo gulo</i> ) Habitat: Alpine tundra and high-elevation boreal forests that maintain deep persistent snow into late spring	[N] No high-elevation habitat with persistent spring snowpack occurs in the Project Area. Wolverine sightings have not been reported near the Project Area; however, wolverines may travel through the area at any time ( <i>MNHP data, June 28, 2017</i> ). Thus, no adverse direct, secondary or cumulative adverse effects to wolverines would be anticipated as a result of either alternative.
<b>Big Game Species</b>	
<b>Elk</b>	[Y] <b>Detailed Analysis Provided Below</b> – The Project Area is considered elk, white-tailed deer, and mule deer winter range by DFWP (2008).
<b>Whitetail</b>	
<b>Mule Deer</b>	

## Threatened and Endangered Species

### CANADA LYNX

#### Issue

The proposed activities could reduce landscape connectivity and the availability of suitable Canada lynx habitat, reducing the capacity of the area to support Canada lynx.

#### Introduction

Canada lynx are medium-size cats that prey primarily on snowshoe hares, and they are federally listed as a threatened species (*Ruediger et al. 2000*). Lynx foraging habitat in western Montana consists of a mosaic of young coniferous stands and mature forested stands with high levels of canopy cover, which provide snowshoe hare habitat (*Squires et al. 2010, Squires et al. 2013*). Retaining habitat connectivity of both summer and winter lynx foraging habitat is important since winter corridors may provide local connectivity while

summer corridors are more likely to facilitate long-distance dispersal (*Squires et al. 2013*). Forest management considerations for lynx include providing a mosaic of well-connected young and mature lynx habitat patches containing high horizontal cover.

### Analysis Area

The analysis area for direct and secondary effects is the Project Area and the analysis area for cumulative effects is the 31,555-acre Large CEAA as described in *TABLE WI-1* and depicted in *FIGURE WI-1*. The Large CEAA approximates the size of a lynx home range, is centered on the Project Area, and is defined according to geographic features (i.e., ridgelines), which are likely to influence movements of Canada lynx in the vicinity of the Project Area providing a reasonable analysis area for Canada lynx that could be influenced by project-related activities.

### Measurement Criteria

Factors considered in the analysis include: 1) the level of harvesting, 2) the availability of suitable lynx habitat classes, and 3) landscape connectivity. Suitable lynx habitat was subdivided into the following lynx habitat classes: 1) winter foraging, 2) summer foraging, 3) other suitable, and 4) temporary non-habitat. All habitat classes were identified according to DNRC's lynx habitat mapping protocols (*USFWS and DNRC 2010*). Other suitable lynx habitat is defined as habitat that has the potential to provide connectivity and lower quality foraging habitat, but does not contain the necessary attributes to be classified as winter or summer foraging habitat classes. The temporary non-habitat category consists of forested stands that are not expected to be used by lynx until suitable horizontal cover develops. On non-DNRC lands, stands with  $\geq 40\%$  canopy cover provided by trees  $> 9$  inches dbh on average were considered to provide potential lynx habitat.

### Existing Environment

The Project Area contains suitable lynx habitat (*TABLE WI-5*). Stands that do not provide potential habitat in the Project Area consist of 343 acres of dry Douglas-fir and western larch stands that are not preferred lynx cover types. Suitable lynx habitat is mostly continuous across the Project Area and is located on cool north-facing slopes and along the unnamed streams which have the potential to act as a travel corridor.

The Large CEAA contains suitable lynx habitat (*TABLE WI-5*), with the majority of potential lynx habitat located on USFS lands in the Smoke Creek drainage. The remaining portions of the CEAA consist primarily of young recently harvested stands that may not have adequate stem densities for lynx use. In the vicinity of the Project Area and on surrounding lands, connectivity of lynx habitats is high to the north and low to the south, with narrow corridors located along streams between habitat patches.

**Table WI-5— Estimated acreage of lynx habitat that would remain in the Project Area and Large CEAA post-harvest. Values in parentheses refer to the percentage of the total potential lynx habitat<sup>a</sup> that each lynx habitat class represents.**

Lynx Habitat Category	Project Area		Large CEAA	
	Existing	Post-Harvest	Existing	Post-Harvest
Other Suitable (DNRC)	31 (10.6%)	14 (4.8%)	31 (0.3%)	14 (0.1%)
Summer Foraging (DNRC)	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
Winter Foraging (DNRC)	261 (89.4%)	44 (15.1%)	261 (2.2%)	44 (0.4%)
Temporary Non-habitat (DNRC)	0 (0%)	234 (80.1%)	0 (0.0%)	234 (2.0%)
Additional Potential Habitat – non-DNRC Ownership	0 (0%)	0 (0%)	11,640 (97.6%)	11,640 (82.6%)
Grand Total - Suitable Lynx Habitat <sup>a</sup> (All Ownerships)	292 (100.0%)	58 (19.9%)	11,932 (100.0%)	11,698 (98.0%)

<sup>a</sup>Total potential lynx habitat describes all areas that contain appropriate habitat types for lynx (i.e., sum of summer forage, winter forage, other suitable, and temporary non-suitable lynx habitat classes).

<sup>b</sup>Total suitable lynx habitat describes all lynx habitat categories that contain structural attributes necessary for lynx use (i.e., sum of summer forage, winter forage, other suitable lynx habitat classes, potential habitat on non-DNRC lands).

## **Environmental Effects**

### **No Action Alternative: Direct, Secondary, and Cumulative Effects on Canada Lynx**

None of the proposed forest management activities would occur on DNRC lands. In the short-term, lynx habitat availability and connectivity would not change. In the long-term and in the absence of natural disturbance, winter foraging habitat availability would increase due to natural forest succession while summer foraging habitat availability would decrease due to the lack of young regenerating stands. Connectivity may also increase in the long-term due to increasing canopy cover over time.

### **Action Alternative: Direct and Secondary Effects on Canada Lynx**

The proposed activities would affect 286 acres (97.9%) of the 292 acres of suitable lynx habitat available in the Project Area. After harvest, 234 of these acres would be temporarily unsuitable for lynx use due to lack of canopy cover in the understory and overstory (*TABLE WI-5*). These may be suitable for lynx use again in 10-15 years after young trees have grown to a sufficient height. The remaining acres would be treated with a lighter harvest and would remain suitable for lynx use post-harvest. To ensure that forest structural attributes preferred by snowshoe hares remain following harvest, dense patches of advanced regeneration would be retained in lynx winter forage habitat. Additionally, 12 to 24 tons/acre of coarse woody debris would be retained in accordance with DNRC Forest Management Rules (*ARM 36.11.414*) and retention of downed logs  $\geq 15$  inch diameter would be emphasized. Lynx habitat connectivity would be reduced; however, overall, suitable lynx habitat would remain continuous due to the retention of a 300-foot wide corridor along the unnamed tributary to the Fisher River. If present in the vicinity of the Project Area, lynx could be temporarily displaced by forest management activities for approximately 3 years plus additional time to complete prescribed burning. Thus, since: 1) lynx suitable habitat availability would be reduced by 234 acres (80.1%) of existing habitat in the Project Area; 2) an additional 52 acres (17.8%) would be harvested, but would continue providing suitable habitat post-harvest; 3) patches of shade-tolerant trees would be retained where feasible in winter foraging habitat; and 4) landscape connectivity would be reduced but corridors would remain; high adverse direct and secondary effects to Canada lynx associated with landscape connectivity and availability of suitable habitat would be anticipated as a result of the Action Alternative.

### **Action Alternative: Cumulative Effects on Canada Lynx**

The proposed activities would affect 286 acres (2.4%) of the 11,932 acres of suitable lynx habitat available in the Large CEAA. These majority of these acres (234 acres) would be temporarily unsuitable for lynx use due to lack of canopy cover in the understory and overstory. Patches of shade tolerant trees and approximately 12 to 24 tons/acre of coarse woody debris would be retained emphasizing retention of downed logs  $\geq 15$  inch diameter to provide important lynx and snowshoe hare habitat components. Lynx habitat connectivity would be slightly reduced; but 300-foot wide corridors along an unnamed tributary to the Fisher River would be retained. Overall, connectivity of potential lynx habitat in the vicinity of the Project Area would remain high north of the Project Area and low south of the Project Area. Changes to lynx habitat availability and connectivity would be additive to past, proposed, and ongoing project (see *TABLE WI-2*). Lynx could be temporarily displaced by forest management activities associated with the Smoke-Brulee Timber Sale and other ongoing activities for approximately 3 years. Thus, since: 1) lynx suitable habitat availability would be reduced by 234 acres (2.0% of potentially suitable lynx habitat in the Large CEAA); 2) an additional 52 acres (0.4% of potentially suitable lynx habitat in the Large CEAA) would be harvested, but would continue providing suitable habitat post-harvest; 3) patches of advanced regeneration and shade-tolerant understory trees would be retained where feasible; and 4) landscape connectivity would be slightly reduced, but would overall impacts would be minimal considering little suitable habitat borders the Project Area; minor adverse cumulative effects to Canada lynx

associated with landscape connectivity and suitable habitat type availability would be anticipated as a result of the Action Alternative.

## **GRIZZLY BEAR**

### **Issue**

The proposed activities could affect grizzly bear cover, affect important habitat, and increase human access, which could adversely affect bears by displacing them from important habitat, and/or by increasing risk of human-caused bear mortality.

### **Introduction**

Grizzly bears are opportunistic omnivores that inhabit a variety of habitats in Montana. Preferred grizzly bear habitat includes avalanche chutes, fire-mediated shrub fields, and riparian areas, all of which provide seasonal food sources (*Servheen and Klaver 1983, McLellan and Hovey 2001*). Grizzly bears are federally listed as a threatened species and primary threats are related to human-bear conflicts and long-term habitat loss associated with human development (*Mace and Waller 1997*). Forest management considerations for grizzly bears include minimizing potential for conflicts with humans, minimizing adverse effects to vegetation and cover, minimizing access and the construction of new roads, and reducing disturbance levels during the non-denning season, especially in the spring and fall periods when grizzly bears have important nutritional demands.

### **Analysis Area**

The analysis area for direct and indirect effects is the Project Area and the analysis area for cumulative effects is the 31,555-acre Large CEAA as described in *TABLE WI-1* and depicted in *FIGURE WI-1*. The Large CEAA is defined by geographic features and approximates the home range size of a female grizzly bear in northwest Montana.

### **Measurement Criteria**

Factors considered in the analysis included: 1) the degree of harvesting, 2) the availability of visual screening cover, 3) risk of displacement from important grizzly bear habitat including spring habitat and riparian habitat, and 4) open and restricted road densities. Visual screening was estimated by evaluating forest stand size class and the total crown density of all trees in the stand using GIS and SLI data. Seedlings/sapling stands were included in estimates of visual screening cover if they were >4 feet tall and contained  $\geq 350$  trees/acre. On non-DNRC lands the acreage of stands with  $\geq 40\%$  canopy cover provided by trees >9 inches dbh on average was queried to estimate the availability of visual screening cover.

### **Existing Environment**

The Project Area is considered grizzly bear NROH habitat associated with the CYE (*USFWS 1993, Wittinger 2002*). The Project Area does not occur in any important potential linkage zone for grizzly bears (*Servheen et al. 2003*). Grizzly bears are more frequently observed in the west Cabinet Mountains; however, grizzly bears may use the Project Area at any time. Approximately 587 acres (92.4%) in the Project Area possess cover in amounts capable of providing visual screening for grizzly bears, which would allow grizzly bears to travel freely in the Project Area, should they be present. Important bear habitat types including huckleberry patches and avalanche chutes are not present in the Project Area. However, riparian areas associated with the unnamed streams in the Project Area and may provide seasonal foods and may serve as a travel corridor. The Project Area is at a low elevation and is considered potential spring habitat for grizzly bears. There are no open roads in the Project Area.

Most the Large CEAA (70.3%) is recovery zone habitat or is considered NROH associated with the CYE. The Large CEAA contains a variety of age classes of forested habitat as well as some riparian habitat. Mature forested habitat is concentrated primarily in the Smoke Creek, Miller Creek, and West Fisher drainages. Hiding cover is present in at least 11,640 acres (36.8% of the Large CEAA). Ownership in the Large CEAA

consists primarily of USFS Lands (55%) and Weyerhaeuser Lands (37%). Overall open road density is moderate at 2.9 miles/square mile.

### **Environmental Effects- Grizzly Bears**

#### **No Action Alternative: Direct, Secondary, and Cumulative Effects on Grizzly Bears**

None of the proposed forest management activities would occur. In the short-term, no changes to grizzly bear habitat would be expected. Visual screening, risk of displacement, and open and restricted road density would not be affected. However, in the long-term and in the absence of natural disturbance, visual screening may increase as stands age increasing the availability of visual screening. Thus, no adverse direct, secondary or cumulative effects associated with grizzly bear displacement or human-caused bear mortality risk would be anticipated as a result of the No-Action Alternative.

#### **Action Alternative: Direct and Secondary Effects on Grizzly Bears**

Timber harvest would affect 578 acres (98.5%) of the 587 acres of visual screening available in the Project Area. After harvest, 523 of these acres would not provide hiding cover due to low conifer density although small patches of trees and shrubs would be retained. The remaining 55 acres would continue providing quality hiding cover along streams. Harvesting and prescribed burning associated with the Action Alternative would increase sight distances within proposed harvest units, although the availability of forage plants would likely increase over time. Approximately 4.2 miles of permanent road would be built to access the proposed harvest units. Post-harvest, these roads would be closed behind a gate. An additional 1.5 miles of temporary roads would be constructed; however, the first 200 feet recontoured post-harvest and these roads would no longer be accessible. If present near the Project Area, grizzly bears could be displaced from portions of the Project Area by forest management activities for up to 3 years plus additional time to complete prescribed burning; although spring timing restrictions would be enforced from April 1 – June 15 to provide security for grizzly bears in the spring. Thus, since: 1) canopy cover and shrubs providing visual screening and hiding cover would be removed, although shelterwood treatments would retain some cover; 2) motorized disturbance would increase for approximately 3 years; 3) open road density would not increase, but total road density would increase by 4.2 miles; and 4) proposed burn treatments may increase the availability and productivity of forage plants; moderate adverse direct or indirect effects associated with grizzly bear displacement or human-caused bear mortality risk would be anticipated as a result of the Action Alternative.

#### **Action Alternative: Cumulative Effects on Grizzly Bears**

The proposed activities would affect 578 acres (5.2%) of the 11,640 acres of visual screening available in the Large CEAA. Harvesting and prescribed burning associated with the Action Alternative would increase sight distances within proposed harvest units and post-harvest, 523 of the acres proposed for timber harvest would not provide good hiding cover for bears. However, small patches of shrubs and regeneration would be retained and cover and forage plants would likely grow back soon after burning is complete. The remaining 55 acres would continue providing visual screening post-harvest. Proposed harvesting would increase traffic on approximately 25 miles of roads in the Large CEAA, including 4.2 miles of road proposed for construction in the Project Area. Roads proposed for construction would not be accessible to the public and would be effectively closed to motorized public use post-harvest via a gate. An additional 1.5 miles of temporary roads would be constructed and would have the first 200 feet recontoured post-harvest. Reductions in visual screening would be additive to any proposed or ongoing projects on adjacent ownerships. Grizzly bears could be temporarily displaced by forest management activities associated with the proposed Smoke-Brulee Timber Sale and other ongoing projects for up to 3 years plus additional time to complete prescribed burning; however, activities would be restricted from April 1 – June 15 to protect bears in the spring. Thus, since: 1) canopy cover and shrubs providing visual screening would be removed from approximately 523 acres (4.5%) of potential visual screening in the Large CEAA; 2) temporary motorized disturbance would increase on 25 miles of existing open and restricted roads and newly constructed restricted roads and in the Large CEAA; 3) road density would increase in the Large CEAA post-harvest, but open road density would be unaffected; and 4) ) proposed burn treatments may increase the availability and productivity of forage plants; minor adverse

cumulative effects associated with grizzly bear displacement or human-caused bear mortality risk would be anticipated as a result of the Action Alternative.

## Sensitive Species

### FISHERS

#### Issue

The proposed activities could reduce the availability and connectivity of suitable fisher habitat and increase human access, which could reduce fisher habitat suitability and increase trapping mortality

#### Introduction

In the Rocky Mountains, fishers prefer mesic late-successional forests with complex vertical and horizontal structure, large-diameter trees, and relatively dense canopies (*Raley et al. 2012, Schwartz et al. 2013*). Fishers generally avoid large openings, clearcuts, and ponderosa pine and lodgepole pine stands (*Schwartz et al. 2013*). Fishers prey upon snowshoe hares, ungulate carrion, porcupines, birds, and small mammals as well as seasonally available fruits and berries. Fisher resting and denning sites are found in cavities of live trees and snags, downed logs, brush piles, mistletoe brooms, squirrel and raptor nests, and holes in the ground. Forest-management considerations for fishers involve providing upland and riparian resting and denning habitat, maintaining a network of travel corridors, and reducing trapping risk associated with motorized access.

#### Analysis Area

The analysis area for direct and secondary effects is the Project Area and the analysis area for cumulative effects is the 8,243-acre Medium CEAA as described in *TABLE WI-1* and depicted in *FIGURE WI-1*. The Medium CEAA is centered on the Project Area and is defined according to geographic features and could support the home range of at least one fisher, providing a reasonable analysis area for fishers that could be influenced by project-related activities (*Olson et al. 2014*).

#### Measurement Criteria

Factors considered in the analysis include: 1) the degree of harvesting, 2) availability and structure of preferred fisher habitats (upland, riparian), and 3) landscape connectivity. Fisher habitat classifications considered in the analysis include: 1) upland fisher habitat, and 2) riparian fisher habitat, which are defined according to proximity of the forest stand to streams. Riparian fisher habitat is located within 100 feet of Class 1 streams or within 50 feet of Class 2 streams (*ARM 36.11.440(b)*). The remaining fisher habitat is considered upland fisher habitat. Habitat structure considered appropriate for fisher use includes stands with 40-100% total stocking density. Potential fisher habitat (riparian, upland) on other ownerships was identified by identifying mature forested habitat ( $\geq 40\%$  cover, trees  $> 9$  inches dbh average) below 6,000 feet elevation and proximity to perennial and intermittent streams.

#### Existing Environment

Fisher habitat is present in the Project Area and Medium CEAA (*TABLE WI-6*). In the Project Area, suitable moist stands of Douglas-fir and larch are located on cool north facing slopes and are interspersed with dry Douglas-fir stands that are not suitable habitat types.

In the Medium CEAA, potential fisher habitat is located on cooler slopes in the northern portion of the CEAA in the Smoke Creek drainage where there is a higher proportion of USFS lands (*TABLE WI-6*). The Brulee Creek drainage contains more recently harvested timber stands that would not provide suitable habitat for fishers and is not as likely to provide suitable habitat.

**Table WI-6 –Fisher Habitat in the Project Area and Medium CEAA and anticipated effects of the Smoke-Brulee Timber Sale, including potential habitat on non-DNRC ownership. Values in parentheses refer to the percentage that each fisher habitat type represents within the larger analysis area.**

Fisher Habitat Attribute	Project Area		Medium CEAA	
	Existing	Post-Harvest	Existing	Post-Harvest
Fisher Habitat <sup>a</sup>	289 (45.5%)	44 (6.9%)	2,850 (34.6%)	2,605 (31.6%)
Fisher Riparian Habitat	24 (3.8%)	20 (3.1%)	221 (2.7%)	217 (2.6%)
Fisher Habitat Harvest (% of available habitat)	283 (97.9%)		283 (9.9%)	

<sup>a</sup> Includes potential habitat available on other ownerships.

## **Environmental Effects**

### **No Action Alternative: Direct, Secondary, and Cumulative Effects on Fishers**

None of the proposed forest management activities would occur on DNRC lands. The level of motorized access would not change and no additional risk associated with trapping would be expected. In the short term, no changes to fisher habitat availability or connectivity would occur. In the long-term and in the absence of natural disturbance, fisher habitat suitability and connectivity may increase as stands age, the availability of large-diameter trees increases, and mature canopy cover increases.

### **Action Alternative: Direct and Secondary Effects on Fishers**

The proposed activities would affect fisher habitat (*TABLE WI-6*). Approximately 245 acres of fisher habitat would be treated with a shelterwood treatment and would not provide suitable fisher habitat post-harvest due to low retention of mature trees. An additional 38 acres of fisher habitat would be treated with a lighter harvest in travel corridors and these stands would continue providing suitable fisher habitat, albeit at a reduced stand density. Approximately 4 acres of fisher riparian habitat would be harvested and would not be suitable for fisher use post-harvest. The availability of some important habitat characteristics (i.e., snags, coarse woody debris) could be reduced by harvest activities; although retention of dead material and live snag recruitment trees would meet DNRC Forest Management Rules (*ARM 36.11.411*, *ARM 26.11.414*). Approximately 4.2 miles of permanent road would be built to access the proposed harvest units. Post-harvest, these roads would be closed behind a gate therefore trapping risk would increase slightly. Connectivity of mature forested habitat suitable for fisher use would decrease under the Action Alternative, although a travel corridor would remain along the tributary to the Fisher River. If present in the vicinity of the Project Area, fishers could be temporarily displaced by forest management activities approximately 3 years plus additional time to complete prescribed burning. Thus, since: 1) habitat availability would be reduced by 245 acres (84.7%), but some snags and coarse woody debris would be retained; 2) Stand density would be reduced in an additional 38 acres (13.1%) of fisher habitat; 3) approximately 4 acres of riparian fisher habitat would be harvested and would not be suitable for fisher use; 4) landscape connectivity would be reduced, but a connectivity corridor would be retained; and 5) 4.2 miles of new restricted roads would be constructed, increasing trapping risk; high adverse direct and secondary effects to fisher associated with habitat suitability and trapping risk would be anticipated as a result of the Action Alternative.

### **Action Alternative: Cumulative Effects on Fishers**

Fisher habitat would be affected by the proposed activities (*TABLE WI-6*). Approximately 245 acres would not be suitable for fisher use post-harvest due to low tree retention and 38 acres would continue providing fisher habitat at a reduced stand density. The availability of some important habitat characteristics (i.e., snags, coarse woody debris) could be reduced by harvest activities; although retention of some dead material and live snag recruitment trees would be required to meet DNRC Forest Management Rules (*ARM 36.11.411*, *ARM 26.11.414*). Connectivity to existing potential habitat patches in the Smoke Creek drainage would be retained post-harvest via a 300-foot wide corridor along the unnamed tributary to the Fisher River. Approximately 4.2 miles of new roads that would allow motorized administrative use and non-motorized public use would be constructed, increasing trapping risk. Any adverse effects to fisher would be additive to any proposed or ongoing sales in the Medium CEAA, although DNRC is unaware of any such projects at this time. Fisher



displacement associated with the proposed Smoke-Brulee Timber Sale and any other activities in the CEAA could occur for up to 3 years. Thus, since: 1) habitat availability would decrease by 245 acres (8.6% of available potential habitat), but snags and coarse woody debris would be retained (*ARM 36.11.411, ARM 26.11.414*); 2) an additional 38 acres (1.3%) would be harvested, but would remain suitable for fisher use post-harvest; 3) 4 acres of riparian harvest would occur, and these acres would not be suitable for fisher use post-harvest; 4) landscape connectivity would be reduced, but a travel corridor would be retained; and 5) 4.2 miles of new roads open to motorized administrative use and non-motorized public use would be constructed, increasing trapping risk; minor adverse cumulative effects to fisher associated with habitat suitability and trapping risk would be anticipated as a result of the Action Alternative.

## **FLAMMULATED OWL**

### **Issue**

The proposed activities could alter the structure of flammulated owl preferred habitat, which could reduce habitat suitability for flammulated owls.

### **Introduction**

Flammulated owls are small, migratory, insectivorous forest owls that inhabit mature, dry stands of ponderosa pine and Douglas-fir with an open physiognomy (*Linkhart and McCallum 2013*). Flammulated owls are secondary cavity nesters, and in Montana, typically nest in large-diameter ponderosa pine or Douglas-fir cavities excavated by pileated woodpeckers or northern flickers (*Seidensticker et al. 2013*). Forest management considerations for flammulated owls include providing open stands of ponderosa pine and Douglas-fir and retaining large snags for nesting. Timber harvest may affect the structure of timber stands and reduce the availability of snags, potentially reducing habitat suitability for flammulated owls.

### **Analysis Area**

The analysis area for direct and secondary effects is the Project Area and the analysis area for cumulative effects is the 8,243-acre Medium CEAA as described in *TABLE WI-1* and depicted in *FIGURE WI-1*. The Medium CEAA is defined according to ridgelines and creeks, which provides a reasonable analysis area for local flammulated owls that could be affected by project-related activities.

### **Measurement Criteria**

Factors considered in the analysis include: 1) the degree of harvesting, and 2) the structure of flammulated owl preferred habitat. In the Project Area, SLI data were used to identify preferred flammulated owl habitat types (*ARM 36.11.403(28)*). Stands were considered suitable for flammulated owl use if the stocking density of trees >9 inches dbh was in the poorly-stocked class (10-39% canopy cover). On non-DNRC lands, stands containing 10-39% canopy cover that were composed primarily of trees >9 inches dbh below 6,000 feet were considered likely to contain habitat types preferred by flammulated owls as well as matrix habitat.

### **Existing Environment**

The Project Area contains 343 acres (54.0% of Project Area) of cover types preferred by flammulated owls. This habitat is composed primarily of mixed Douglas-fir and ponderosa pine stands with some western larch. Approximately 114 acres of these stands are mature (> 9 inches dbh) and contain appropriate stocking density; however, the stocking density is high in the remaining acres and these stands are not likely to be used by flammulated owls.

The Medium CEAA contains approximately 1,794 acres (21.8% of Medium CEAA) of mature open forested stands (10-39% canopy cover, 9 inches dbh average). These stands are scattered throughout the CEAA. Considering the high open road density and accessibility for firewood harvesting, snags availability for nesting may be low in the Smoke Creek drainage.

### **Environmental Effects**



### **No Action Alternative: Direct, Secondary, and Cumulative Effects on Flammulated Owls**

None of the proposed forest management activities would occur on DNRC lands. In the short-term, no change in the availability of flammulated owl habitat would occur. In the long-term and in the absence of natural disturbance, the suitability of flammulated owl habitat may decrease as stand density increases.

### **Action Alternative: Direct and Secondary Effects on Flammulated Owls**

Timber harvest would occur in 340 of the 343 acres (99.1%) of preferred flammulated owl cover types available in the Project Area. The proposed activities would open stands to 10-25% canopy cover in these acres, improving stand structure suitability for flammulated owls. Additionally, the proposed harvest would favor leaving Douglas-fir while removing shade-tolerant trees, which is preferable for flammulated owls (*ARM 36.11.437(b)*). Some snags could be removed by the proposed harvest, but at least 2 large snag and 2 large snag recruitment tree per acre (>21 inches dbh) would be retained (*ARM 36.11.411*). Disturbance associated with harvesting could adversely affect flammulated owls for approximately 3 years, should they be present in the Project Area. Thus, since: 1) changes in stand structure and cover type would generally increase flammulated owl habitat suitability, and 2) snags would be retained to meet DNRC administrative rules (*ARM 36.11.411*), minor beneficial direct and secondary effects to flammulated owl habitat suitability would be anticipated as a result of the Action Alternative.

### **Action Alternative: Cumulative Effects on Flammulated Owls**

The proposed activities would occur in 340 acres (18.9%) of the 1,452 acres of potential flammulated owl habitat in the Medium CEAA. The proposed activities would open stands to 10-25% canopy cover, favor retention of Douglas-fir, and retain patches of regenerating conifers, improving stand structure suitability for flammulated owls (*ARM 36.11.437(b)*). Changes in flammulated owl habitat suitability would be additive to proposed and ongoing activities occurring in the Medium CEAA, although DNRC is currently unaware of such projects. The Action Alternative could disturb flammulated owls for up to 3 years should they be present in the vicinity of the Project Area. Thus, since 1) changes in structure and cover type would generally increase flammulated owl habitat suitability, and 2) snags would be retained to meet DNRC administrative rules (*ARM 36.11.411*), minor beneficial cumulative effects to flammulated owl habitat suitability would be anticipated as a result of the Action Alternative.

## **PILEATED WOODPECKERS**

### **Issue**

The proposed activities could reduce tree density and alter the structure of mature forest stands, which could reduce habitat suitability for pileated woodpeckers.

### **Introduction**

Pileated woodpeckers play an important role in mature forests by excavating large cavities that are often used in subsequent years by a variety of wildlife species for nesting and roosting. Pileated woodpeckers require mature forest stands with large-diameter ( $\geq 20$  inch dbh) dead or defective trees for nesting and foraging and the density of pileated woodpeckers is positively correlated with the amount of dead and dying wood in a stand (*McClelland 1979*). Timber harvest may remove large-diameter trees necessary for nesting and fragmentation can make birds more vulnerable to predation as they travel between habitat patches (*Bull and Jackson 2011*). Forest management considerations for pileated woodpeckers include retaining dense patches of old and mature coniferous forest with abundant large snags and coarse-woody debris for foraging, roosting, and nesting.

### **Analysis Area**

The analysis area for direct and secondary effects is the Project Area and the analysis area for cumulative effects is the 8,243-acre Medium CEAA defined according to geographic features as described in *TABLE WI-1* and depicted in *FIGURE WI-1*. This scale provides a sufficient area to support multiple pairs of pileated woodpeckers (*Bull and Jackson 2011*).

### **Measurement Criteria**

Factors considered in the analysis include: 1) the degree of harvesting and 2) the structure of pileated woodpecker preferred habitat types. On DNRC-managed lands, sawtimber stands  $\geq 100$  years old within preferred pileated cover types (*ARM 36.11.403(58)*) with  $\geq 40\%$  canopy closure were considered potential pileated woodpecker habitat. On non-DNRC lands, mature forest stands ( $\geq 40\%$  canopy cover,  $>9$  inches dbh average) below 6,000 feet elevation were considered potential pileated woodpecker habitat.

### **Existing Environment**

The Project Area contains 555 acres (87.3% of Project Area) of suitable pileated woodpecker habitat. This habitat is composed of Douglas-fir and western larch stands. Pileated woodpeckers were observed during field visits and snags were available for nesting, particularly along the creeks.

The Medium CEAA contains 3,116 acres (37.8% of Medium CEAA) of potential pileated woodpecker habitat scattered throughout the CEAA including 555 acres on DNRC lands and 2,561 acres on other ownerships. An additional 1,552 acres of mature stands with  $<40\%$  canopy cover occur in the CEAA, which may facilitate connectivity, but would not provide suitable habitat. The remaining stands consist primarily of young stands that were recently harvested and contain low densities of mature trees. Open road density in the Medium CEAA is 1.6 miles/square mile, which provides access for firewood cutting and may reduce snag availability for nesting.

### **Environmental Effects**

#### **No Action Alternative: Direct, Secondary, and Cumulative Effects on Pileated Woodpeckers**

None of the proposed forest management activities would occur on DNRC lands. In the short-term, no changes to pileated woodpecker habitat would be anticipated. However, in the long-term, and in the absence of natural disturbance, pileated woodpecker habitat availability and connectivity may increase due to natural succession and aging of timber stands.

#### **Action Alternative: Direct and Secondary Effects on Pileated Woodpeckers**

The proposed activities would occur in 546 acres (98.5%) of the 555 acres of pileated woodpecker habitat available in the Project Area. Shelterwood treatments proposed for 520 of these acres would open stands to approximately 25% canopy cover causing the structure of these stands to become unsuitable for appreciable use by pileated woodpeckers. The remaining acres would be treated with lighter cuts in RMZs and travel corridors and would remain suitable for pileated woodpecker use post-harvest. Snags would be removed by the proposed harvest, but at least 2 large snags and 2 large snag recruitment trees per acre ( $>21$  inches dbh) would be retained and snags cut for safety reasons would be left in the harvest unit (*ARM 36.11.411*).

Disturbance associated with harvesting could adversely affect pileated woodpeckers on portions of the Project Area for approximately 3 years plus additional time to complete prescribed burning, should they be present in the Project Area. Thus, since: 1) forest structural changes would occur, but mitigation would include retention of snags and coarse woody debris (*ARM 36.11.411*, *ARM 36.11.414*); and 2) harvesting would reduce pileated woodpecker suitable habitat availability by 520 acres (93.7%); high adverse direct and secondary effects to pileated woodpecker habitat suitability in the Project Area would be anticipated as a result of the Action Alternative.

#### **Action Alternative: Cumulative Effects on Pileated Woodpeckers**

The proposed activities would occur in 546 acres (17.5%) of the 3,116 acres of potential pileated woodpecker habitat in the Medium CEAA reducing habitat availability. Approximately 520 of these acres would not provide suitable pileated woodpecker use post-harvest while the remaining acres would retain adequate stand structure for the woodpeckers. Snags would be removed by the proposed harvest, but at least 2 large snags and 2 large snag recruitment trees per acre (>21 inches dbh) would be retained (*ARM 36.11.411*). Changes in pileated woodpecker habitat suitability would be additive to proposed and ongoing activities occurring in the Medium CEAA, although DNRC is currently unaware of such projects. Disturbance associated with the proposed activities could adversely affect pileated woodpeckers in the vicinity of the Project Area for up to 3 years plus additional time to complete prescribed burning. Thus, since: 1) structural changes would occur, but mitigations would include retention of snags and coarse woody debris; and 2) harvesting would reduce pileated woodpecker suitable habitat availability by 520 acres (16.7%) within the Medium CEAA; minor adverse cumulative effects to pileated woodpecker habitat suitability would be anticipated as a result of the Action Alternative.

## **BIG GAME**

### **ELK, WHITE-TAILED DEER, AND MULE DEER WINTER RANGE**

#### **Issue**

The proposed activities could reduce cover, which could reduce the quality of big game winter range habitat.

#### **Introduction**

Elk, mule deer, and white-tailed deer require areas with adequate amounts of cover and forage at lower elevations during winter. Effective big game winter range contains ample mid-story and overstory, which can ameliorate severe winter conditions by reducing wind velocity and providing snow intercept, enabling big game to move across the landscape, and by improving access to forage with less energy expenditure. Forest management considerations for big game include providing adequate hiding cover and ample overstory, which lessen the effects of harsh winter weather conditions.

#### **Analysis Area**

The analysis area for direct and indirect effects is the Project Area and the analysis area for cumulative effects is the 8,243-acre Medium CEAA as described in *TABLE WI-1* and depicted in *FIGURE WI-1*. The Medium CEAA is defined according to geographic features including watershed boundaries, which, provides a reasonable analysis area for local animals that could be influenced by project-related activities.

#### **Measurement Criteria**

Factors considered in the analysis include: 1) the degree of timber harvesting and 2) the availability and structure of big game winter range. Forested habitat (≥40% canopy cover, >9 inch dbh average) was considered capable of providing minimal conditions capable of providing thermal cover for big game in the Medium CEAA.

#### **Existing Environment**

The Project Area provides winter range for wintering white-tailed deer, mule deer, and elk (*DFWP 2008*) and the area contains favorable characteristics for winter range including low elevations (3,280-5,240 feet), south facing slopes, and desirable forage plants such as ceanothus. The Project Area is connected to low elevation winter range habitat along Fisher River, Pleasant Valley Fisher River, and Swamp Creek. Approximately 504 acres (79.4% of Project Area) contain mature canopy cover composed primarily of Douglas-fir and western larch; however, many areas have been affected by Douglas-fir bark beetle and may not provide good thermal cover in the future if outbreaks continue.

The Medium CEAA also contains white-tailed deer, mule deer, and elk winter range (*DFWP 2008*). Frequently used portions of the winter range are likely on south facing slopes of Smoke and Brulee creeks when snow pack is low and north facing slopes may be used more frequently when snow pack is high due to greater amounts of thermal cover. Approximately 3,065 acres (37.2% analysis area) of mature forested habitat ( $\geq 40\%$  canopy cover,  $>9$  inch dbh average) occur in the Medium CEAA and provides thermal protection for big game. Residential development is mostly absent from the Medium CEAA, which reduces the likelihood of big game displacement due to human activity (*Vore 2012*).

### **Environmental Effects**

#### **No Action Alternative: Direct, Secondary, and Cumulative Effects on Big Game**

None of the proposed forest management activities would occur. No changes in disturbance levels would occur. In the short term, no change in the availability of thermal cover would occur. In the long term and in the absence of natural disturbance, thermal cover may increase as stands age and canopy cover increases.

#### **Action Alternative: Direct and Secondary Effects on Big Game**

Canopy cover would be reduced in mature forested habitat from 40 to 75% to approximately 15-25% in 464 acres (92.1%) of mature forested habitat, reducing the capacity of these acres to provide snow intercept and reduce wind velocity. Considering that canopy cover would be reduced below 70% in these harvest units, white-tailed deer would likely not use the harvest units post-harvest when snow accumulation is high. However, elk and mule deer may continue using these areas if snow conditions and temperatures are favorable. An additional 39 acres would be treated with a lighter harvest and would continue providing thermal cover. Additionally, a 300-foot-wide corridor along the unnamed tributary to the Fisher River would facilitate the movement of animals between the Fisher River and good thermal cover located on USFS lands in Section 15. Prescribed burning is proposed and would improve conditions for browse species such as ceanothus and mountain maple, particularly benefiting elk and mule deer. Winter logging may occur, but would not be required and wintering animals could be displaced for up to 3 winters by the proposed activities plus additional time to complete prescribed burning. Thus, since: 1) canopy cover would be reduced on 503 acres, (99.8% of existing mature forested habitat); 2) the harvest prescriptions would reduce disease issues affecting thermal cover, 3) displacement of big game would be temporary (up to 3 years), 4) connectivity would be retained along the unnamed tributary facilitating travel to good thermal cover on the USFS in Section 15, and 5) prescribed burning would likely improve forage for mule deer and elk; minor adverse direct and indirect effects to big game winter range quality and wintering animals would be anticipated as a result of the Action Alternative.

#### **Action Alternative: Cumulative Effects on Big Game**

The proposed harvest would reduce canopy cover in 503 (16.4%) of the 3,065 acres of mature habitat available in the Medium CEAA. Shelterwood treatments would address Douglas-fir bark beetle issues and prescribed burning would increase forage quality, benefiting mule deer and elk. White-tailed deer use of the stand would be reduced, however retention of a 300-foot wide travel corridor would facilitate travel from the Fisher River to good thermal cover on USFS lands. Reductions in thermal cover would be additive to any proposed and ongoing activities in the Medium CEAA, although DNRC is currently unaware of such projects. Winter logging may occur, but would not be required and wintering animals could be displaced for up to 3 winters by the proposed activities. Thus, since: 1) 503 acres of mature forested habitat would be affected (16.4% of mature forested habitat); 2) the harvest prescriptions would reduce disease issues affecting thermal cover; 3) displacement of big game would be additive to other sources of disturbance, but would occur for a short period of time (3 years plus additional time for prescribed burning); 4) connectivity would be retained along the unnamed tributary facilitating travel to good thermal cover on the USFS in Section 15, and 5) prescribed burning would likely improve forage for mule deer and elk; minor adverse cumulative effects to big game winter range quality and wintering animals would be anticipated as a result of the Action Alternative.

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## **Wildlife Mitigations**

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- If a threatened or endangered species is encountered, consult a DNRC biologist immediately. Similarly, if undocumented nesting raptors or wolf dens are encountered within ½ mile of the Project Area contact a DNRC biologist.
- Prohibit contractors and purchasers conducting contract operations from carrying firearms while on duty as per *ARM 36.11.444(2)* and *GB-PR2 (USFWS and DNRC 2010)*.
- Contractors will adhere to food storage and sanitation requirements as described in the timber sale contract. Ensure that all attractants such as food, garbage, and petroleum products are stored in a bear-resistant manner.
- Restrict public access at all times on restricted roads that are opened for harvesting activities. Effectively close all restricted roads following harvest completion.
- Retain patches of advanced regeneration of shade-tolerant trees as per *LY-HB4* on north-facing slopes (*USFWS and DNRC 2010*).
- To protect nesting northern goshawks, prohibit hauling along affected portions of the Smoke Creek haul route April 1- August 15; timing restrictions may be lifted if the territory is unoccupied or reduced if the chicks fledge before August 15.
- Prohibit all mechanized activities including commercial forest management and use of pickups from April 1-June 15 to provide seasonal security for grizzly bears.
- Retain visual screening along roads where possible to increase security for wildlife.
- Retain at least 2 snags and 2 snag recruits per acre that are ≥ 21 inches diameter or the next largest available size class, favoring western larch, ponderosa pine, and Douglas-fir for retention. If snags are cut for safety concerns, they must be left in the harvest unit.
- Retain 12 to 24 tons/acre of coarse-woody debris. Retain coarse-woody debris according to *ARM 36.11.414* and emphasize retention of 15-inch diameter downed logs aiming for at least one 20-foot-long section per acre.

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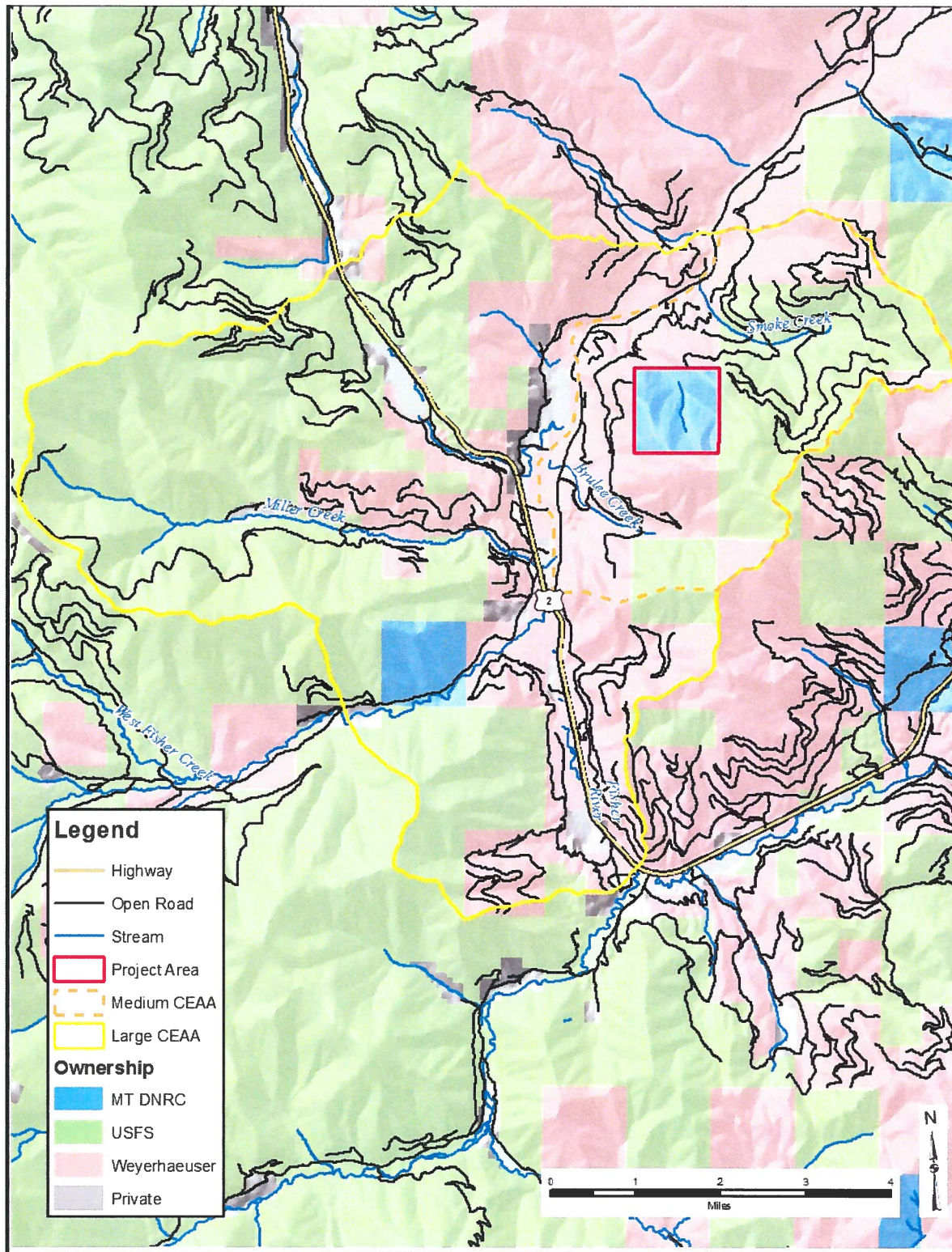
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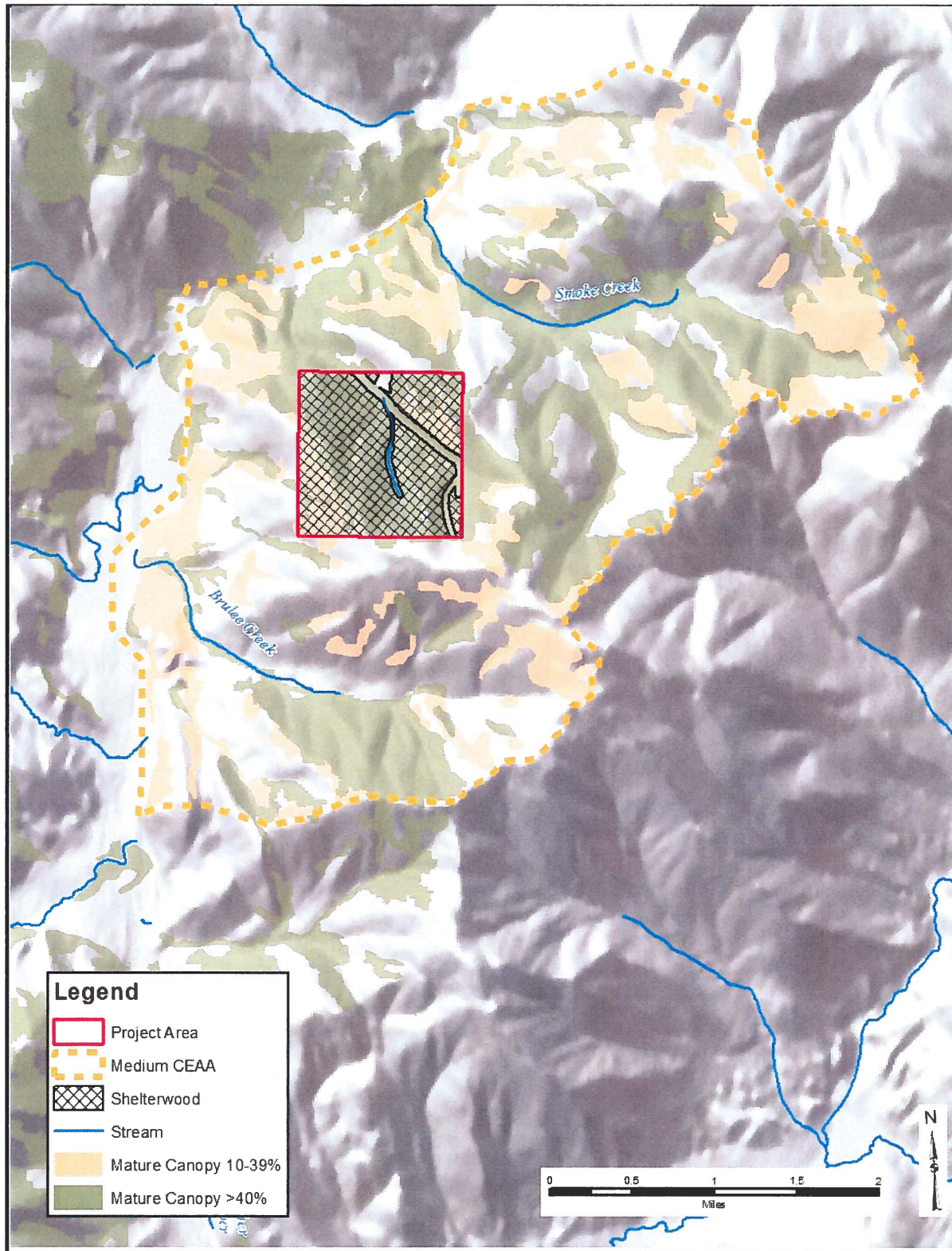


Figure WI-1 –Wildlife analysis areas and harvest units for the proposed Smoke-Brulee Timber Sale.





**Figure W1-2 –Harvest units, mature canopy cover, old-growth, and potential connectivity areas for the proposed Smoke-Brulee Timber Sale.**







## **Attachment E – Vegetation Analysis**

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## **Smoke-Brulee Timber Sale – Vegetation Analysis**

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**Analysis Prepared By:**

**Name: Dave Marsh**

**Title: Libby Unit, Forest Management Supervisor, Montana DNRC**

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### **Introduction**

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The vegetation section describes present conditions and components of the forest as well as the anticipated effects of both the No Action and the Action Alternatives.

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### **Issues and Measurement Criteria**

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- Promote the continued presence and/or reestablishment of historically appropriate timber types on Trust Land included in this project.
- Concern that timber harvesting activities may impact the amount and quality of old growth within the project area
- Improve forest health. Minimize losses in timber volume from mortality due to insect and disease conditions present within the sale area.
- Reduce fire hazard and associated risks of loss to State of Montana, United States Forest Service, and privately owned lands in the area.
- Concern regarding the impacts to threatened and endangered plant and animal species.

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### **Regulatory Framework**

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The following plans, rules, and practices have guided this projects planning and/or will be implemented during project activities:

The lands involved in this proposed project are held in trust by the State of Montana. (Enabling Act of February 22, 1889; 1972 Montana Constitution, Article X, Section 11). The Board of Land Commissioners and the DNRC are required by law to administer these trust lands to produce the largest measure of reasonable and legitimate return over the long run for the beneficiary institutions (Section 77-1-202, MCA).

The DNRC would manage lands involved in this project in accordance with:

- The State Forest Land Management Plan (DNRC 1996),
- Administrative Rules for Forest Management (ARM 36.11.401 through 471),
- The Montana DNRC Forested State Trust Lands Habitat Conservation Plan (HCP) (DNRC 2010)
- and all other applicable state and federal laws.

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### **Analysis Areas**

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## Direct and Secondary Effects Analysis Area

Section 16, T27N, R29W.

## Cumulative Effects Analysis Area

Libby Unit administrative area

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## Existing Conditions

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### Noxious Weeds

The presence and levels of noxious weed populations in the project area is similar to those on adjoining lands in the surrounding area. Spotted knapweed is well established in the project area. St. Johnswort, Oxeye daisy and orange hawkweed plants also occur sporadically across the project area, but all noxious weeds have the highest occurrence along roads.

### Rare Plants

There are no threatened, endangered, or sensitive plant species present in the project area.

### Standard Vegetative Community

- **Stand History/Past Management**

Past and current events have influenced the development of forest conditions on the proposed parcels involved in the project area.

Logging activity has occurred in the past on this section. Approximately 1/3 of the project area has been intensively managed, while the remaining 2/3 of the project area has received comparatively no management, due to roadless terrain. A timber sale was completed in 1990 on approximately 96 acres, where currently there is spotty advanced regeneration to pole sized timber. Other previous timber harvests occurred between 1970 and 1983.

- **Current stand conditions (species composition, size, density, insects and disease, forest age class and distribution, etc.)**

### *Forest Health*

The over mature condition of the unmanaged stands exhibits significant in-growth, above average levels of structural defect, low form class, overcrowding and a higher incidence of disease and mortality. Ocular field observations reveal clumps of mortality, primarily in mature to over-mature timber, due to an epidemic Douglas-fir bark beetle attack.

### *Fire Ecology and Behavior*

The area being analyzed was historically characterized by infrequent, mixed severity and stand replacing wildfires prior to the early 1900's. Since the early 1900's, fire has been virtually eliminated from the project area. The current conditions have created dense, dead and live fuels from ground level to overstory crowns. This stand and fuel structure contributes to an elevated risk of stand replacing fire hazard.

**Table V-1 – Current and appropriate cover type for the Smoke-Brulee TS Project Area.**

Cover Type	Current Acres	Current Percent of Project Area	Desired Future Condition (DFC)	
			Acres	Percent
Subalpine fir	12.5	2	0	0
Douglas-fir	127.8	20	0	0
Lodgepole pine	N/A	N/A	N/A	N/A
Mixed conifer	232.4	37	0	0
Ponderosa pine	79.1	12	321.7	51
Western larch/Douglas-fir	183.7	29	313.8	49
Western white pine	N/A	N/A	N/A	N/A
Non-stocked	N/A	N/A	N/A	N/A
Non-forest	N/A	N/A	N/A	N/A
Other (specify)	N/A	N/A	N/A	N/A
<b>Total:</b>	<b>635.5</b>	<b>100</b>	<b>635.5</b>	<b>100</b>

## Old Growth

DNRC's SLI identified approximately 58 acres of potential old-growth in one stand in the project area. Field reconnaissance confirmed that the stand met the minimum criteria of DNRC's old growth definition. DNRC's SLI identifies 2,601 acres of potential old growth stands on the Libby Unit (8.8% of Libby Unit net acres).

Recognizing that large trees are but one component of old-growth stands and that other forest stand attributes, such as the presence of snags, coarse woody debris, decadence, multi-layered overstory canopy structures, gross volume, and crown cover, are indicative of old-growth forests, DNRC developed a tool to consistently describe the attributes of old-growth stands relative to other old-growth stands on State lands. This tool, known as the Full Old-Growth Index, or FOGI, can be used to provide an indication of the level of development of old-growth stands. The FOGI describes old-growth stands with a score based on the amount or presence of the above-listed old-growth attributes. Stands with higher levels of those attributes will have high FOGI values, indicating a higher level of development of the attributes associated with old-growth stands relative to other old-growth stands, whereas stands with low FOGI values indicate a lower level of old-growth attribute development. FOGI values can be categorized into three classes— low, medium and high—indicating their relative level of development compared to other old growth stands. Stands with low FOGI values would have at least the minimum number of large trees required to be defined as old-growth, with lower amounts of snags and coarse wood debris, gross volume, crown cover, and decadence, and less complexity in the canopy structure. Stands with high FOGI values would have at least the minimum number of large live trees to be defined as old-growth, with higher amounts of the above listed attributes. All 58 acres of old growth in the project area are in the “medium” attribute class.

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## Environmental Effects

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### **No Action Alternative: Direct and Secondary Effects and Cumulative Effects**

Under the No Action Alternative, natural processes would continue to have a direct influence on forest conditions.

### **Action Alternative: Direct, Secondary, and Cumulative Effects**

#### **Noxious Weeds**

##### ***Direct and Secondary***

Forest management activities associated with the action alternative have the potential to facilitate the spreading of existing species or introduce new species to the project area due to soil disturbance and the reduction of forest canopy cover associated with timber harvesting. Additional measures to control noxious weed infestations would include: washing off-road equipment prior to on-site operations, and seeding newly constructed roads with grass.

##### ***Cumulative***

Noxious weeds would be monitored and addressed through the Libby Unit integrated weed management program. The combination of project-level and Unit-wide integrated weed management activities would be expected to maintain or minimally increase noxious weed populations compared to current levels.

#### **Rare Plants**

##### ***Direct, Secondary, and Cumulative Effects***

Because there are no threatened, endangered, or sensitive plant species present in the project area, there would be no effects on those species as a result of implementing the action alternative.

#### **Standard Vegetative Community**

##### ***Direct and Secondary***

##### ***Forest Cover Types and Desired Future Conditions***

The proposed action alternative would harvest timber on approximately 630 acres in the project area. The proposed harvest would capture value currently being lost and focus on the restoration and regeneration of the stands to preferred seral species, generally converting shade tolerant cover types to seral species cover types. Harvesting would change approximately 322.2 acres of the mixed conifer, Douglas-fir, and Sub-alpine fir cover types to the Ponderosa pine and Western larch/Douglas-fir cover types, while the remaining harvested acres would not change cover type. Untreated stands in the project area would not be affected. More detailed information for treatment of individual units can be found in Attachment E-1, Stand Prescription.

##### ***Cumulative***

Across the Libby Unit, the proposed action combined with other timber sales on State lands, would generally move stands toward desired future conditions by reducing the amount of shade-tolerant cover types through the use of harvest treatments that favor the development of early seral cover types.

#### **Old Growth**

***Direct and Secondary  
Old Growth***

Under the Action Alternative, timber harvesting would occur in 58 acres of old-growth in the project area. The use of regeneration treatments on 29 acres would remove those acres from old-growth status and shift them toward a seedling/sapling (0-39 year) age class following establishment of regeneration. The use of old-growth maintenance treatments on the remaining 29 acres of old-growth in the project area would retain at least the minimum number of large live trees necessary to meet DNRC's adopted old-growth definition and those acres would continue to be classified as old growth following harvesting. However, old-growth attribute levels in these stands would be reduced, as the number of large live trees, snags, coarse woody debris, crown cover, gross volume, and amount of decadence would be reduced from current levels. Canopy structure in these stands would be simplified due to tree removal in the lower- and mid-canopy levels. The reduction of old-growth attributes in treated old-growth stands would shift the FOGI class in those stands classified as "medium" prior to harvesting to the "low" class following harvesting.

***Cumulative***

The amount of old growth on the Libby Unit following harvesting would be 2,572 acres (8.7% of the Libby Unit total acres).

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**Vegetation Mitigations**

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- Apply silvicultural prescriptions as identified in Attachment E-1.
- Washing off-road equipment prior to on-site operations, and seeding newly constructed roads with grass.

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**VEGETATION REFERENCES**

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Consultation with Tim Spoelma (Montana DNRC Silviculturist / Ecologist) via E-mail (8-10-17).





## **Attachment E1– Stand Prescription**

## **Smoke-Brulee Timber Sale STAND PRESCRIPTION**

**Name:** Smoke-Brulee

**Date:** 2017

**Unit Number (s):** 1 (119 Ac.) and 2 (511 Ac.)

**Location:** T27N, R29W, Sec. 16

**Elevation:** 3,240 – 5,320 Feet      **Slope:** 25-75%

**Aspect(s):** Unit 1: SW – N, Unit 2: W-N

**Habitat type:** ABGR/LIBO-LIBO, PSME/SYAL-CARU, PSME/CARU-ARUV,  
PSME/CARU-CARU, ABGR/CUN-CLUN, ALBA/LIBO-VASC

**Soils:** Lacustrine terraces, silt loam, 0 to 15% slopes,  
Glaciated mountain sideslopes, very gravelly sandy loam 15 to 60% slopes,  
Disected glaciated mountain slopes, very gravelly sandy loam, 3 to 60% slopes,  
Rock outcrop complex/glaciated mountain, very gravelly sandy loam, 20 to 50% slopes

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### **Description of stand(s):**

- Current species mixture – Current cover types are WL/DF, PP, DF, MC, and SUBALP
- Density, stand structure and age – Well stocked, multi storied,
- Disturbance regime - mixed severity
- Insects/disease issues – Douglas-fir beetle epidemic
- Existing regeneration – Very little, mostly in pockets of GF and DF near drainage bottoms.

### **Treatment Objectives:**

- Desired future conditions – PP, and WL/DF
- Regeneration – Natural, and plant primarily PP, and WL seedlings where needed
- Growth – Good, except fair where soils are rockier.
- Capture value of salvage – DF beetle, and other types mortality will be salvaged.
- Fuel reduction – Stand density would be reduced, and slash would be treated in accordance with best management practices.

### **Prescribed Treatment:**

- Silvicultural system – Even-aged
- Specific harvest treatment for regeneration – Shelterwood, with minor selection harvest in SMZs, and HCP corridors.
- Details of treatment: In shelterwood harvest units, leave Approx. 15 – 25 TPA, spacing - variable, but generally 50-40 feet, preferred retention species order of

preference: WWP, PP, WL, DF, and ES (well formed, vigorous trees, having greater than 40% crowns, and generally of the larger diameter classes, except DF leave tree diameters should be smaller due to DF beetle epidemic).

In HCP corridors, leave adequate over story and shrubs for Lynx, and fisheries compliance, also in Lynx corridor, leave Old-growth type 5 criteria.

- Harvest method – Skyline and Tractor
- Site preparation – Mechanical, and burning if feasible.
- Regeneration plans – Check for natural regeneration approximately 3 Yrs. following harvest, and consider planting PP, and WL seedlings where necessary to achieve desired stocking levels.
- Hazard reduction – Piling and broadcast, or jackpot burning if necessary, and where feasible.